THE PRESENCE AND IMPACT OF PSYCHOLOGICAL SAFETY AND STRESS IN THE NHS WORKFORCE – A MIXED METHODS EXPLORATION OF THE WORKPLACE ENVIRONMENT

Katherine Elizabeth Grailey

A Thesis submitted in fulfilment of requirements for the degree of Doctor of Philosophy of Imperial College London

Department of Surgery and Cancer
Faculty of Medicine
Imperial College London

February 2022

STATEMENT OF ORIGINALITY

I declare that the contents of this Thesis are my own original work, except where explicitly stated. Any parts which are adaptations of other work are appropriately and clearly referenced.

Incorporation of my own works published during the PhD programme in peer reviewed journals is also acknowledged and referenced.

COPYRIGHT DECLARATION

The copyright of this thesis rests with the author. Unless otherwise indicated, its contents are licensed under a Creative Commons Attribution-Non Commercial 4.0 International Licence (CC BY-NC).

Under this licence, you may copy and redistribute the material in any medium or format. You may also create and distribute modified versions of the work. This is on the condition that: you credit the author and do not use it, or any derivative works, for a commercial purpose.

When reusing or sharing this work, ensure you make the licence terms clear to others by naming the licence and linking to the licence text. Where a work has been adapted, you should indicate that the work has been changed and describe those changes.

Please seek permission from the copyright holder for uses of this work that are not included in this licence or permitted under UK Copyright Law.

ABSTRACT

The National Health Service faces many challenges including the preservation of a healthy workforce and prevention of medical error. Psychological Safety, defined as an environment "safe for interpersonal risk taking" can help mitigate these challenges. This environment, where individuals feel safe to "speak up" can promote organisational safety and individual wellbeing. "Stress" is also implicated in the aetiology of error and low job satisfaction, justifying strategies to minimise its occurrence. This Thesis aims to describe key and previously undescribed features regarding the manifestation of psychological safety and stress in healthcare workers.

Existing data regarding psychological safety were explored through a comprehensive evidence synthesis. Three mixed methods studies encompassing qualitative interviews and quantitative surveys were subsequently conducted. These explored the aetiology, presence, impact and sequelae of psychological safety and stress in critical care workers, emergency department staff and hospital managers.

Data provided a detailed understanding of the complexity of the workplace environment from an individual worker's perspective. A reassuring climate of psychological safety was demonstrated in clinical participants. This was lower for managers, highlighting how this environment can differ within the same organisation. Data analyses yielded novel information regarding the influence of situational context and personality on psychological safety and demonstrated the potential for negative consequences of such an environment. Both 'typical' stressors and the COVID-19 pandemic were evaluated, highlighting that whilst generally detrimental, challenging events could create positive sequelae including enhanced camaraderie. Models were developed highlighting key factors within the workplace that can be improved to enhance psychological safety and mitigate stress.

It is important for staff wellbeing and organisational safety that a climate of psychological safety is cultivated, and that stresses are mitigated and supported. Healthcare leaders can use the models presented in this Thesis to identify modifiable areas for change and implement solutions within their own workplace environments.

ACKNOWLEDGEMENTS

I am hugely grateful to Professor Stephen Brett, not only for his brilliant mentorship and guidance throughout this PhD programme, but his support navigating the challenges of a PhD through the trials of a pandemic and a broken hip. I consider myself to be extremely lucky for having a supervisor who makes so much time for his students, and whose encouragement allowed me to pursue my own research interests.

I would like to thank Dr. Eleanor Murray for her ongoing support, supervision and qualitative expertise at every stage during this PhD programme. I would also like to thank Dr. Tom Reader and Dr. Jo Billings for their collaboration and guidance.

I would like to thank Clare Leon-Villapalos and Adam Lound for their valuable time in transcribing qualitative interview transcripts and facilitating ongoing analysis. I appreciate the feedback on my work during early and late-stage assessments from Dr. David Antcliffe and Dr. Daniel Leff. I would like to thank BUPA Cromwell Hospital for their financial support, facilitating this research and conference attendances.

I am thankful for the support of Professor Anthony Gordon and my research group in the Department of Surgery and Cancer who have encouraged me and given me plenty of practice in the defence of qualitative research! In particular, I would like to thank Farah for her constant support and for making the research office a very happy place for us all to be.

I am grateful to all the participants who took the time to participate in qualitative interviews and surveys, notably when the NHS was under great pressure during the COVID-19 pandemic. I would also like to thank the senior nurses and hospital managers within Imperial College NHS Healthcare Trust who assisted with recruitment and advertisement of the research studies.

I am thankful for the support of my parents and my brilliant friends, who have kept me going through the challenges faced over the last few years. Thank you to Becky and Hannah for always listening, and in particular thanks to Josh, for your friendship and for giving me the confidence to embark upon a PhD. Finally thank you Rhodri, for your unwavering support and belief in me.

CONTENTS

STATEMENT OF ORIGINALITY ***2***

COPYRIGHT DECLARATION ***3***

ABSTRACT ***4***

ACKNOWLEDGEMENTS ***5***

TABLES ***11***

FIGURES ***12***

ABBREVIATIONS ***15***

GLOSSARY ***16***

1. CHAPTER 1: INTRODUCTION ***18***

1.1. BACKGROUND 18
1.1.1. THE PROVISION OF HEALTHCARE WITHIN THE UNITED KINGDOM 18
1.1.1.1. Organisational Challenges 18
1.1.1.2. Staff Wellbeing Within the NHS 19
1.1.1.3. The Critical Care Environment 21
1.1.1.4. The Emergency Department 22
1.1.1.5. The Role of Hospital Managers within the NHS 22
1.1.2. PSYCHOLOGICAL SAFETY 23
1.1.2.1. Defining Psychological Safety 23
1.1.2.2. The Importance of Psychological Safety 26
1.1.2.3. Antecedents of a Psychologically Safe Environment 27
1.1.2.4. The Significance of Psychological Safety in the Healthcare Environment 28
1.1.2.5. Unanswered Research Questions on the Topic of Psychological Safety 30
1.1.3. THE WORKPLACE ENVIRONMENT 30
1.1.3.1. Concept of the Workplace Environment 31
1.1.3.2. The Impact of the Workplace Environment on Individuals 31
1.1.3.3. The Job Demand Control Model 33
1.1.4. WORKPLACE STRESS IN THE HEALTHCARE ENVIRONMENT 34
1.1.4.1. Contributors to Stress 34
1.1.4.2. Consequences of Stress in Healthcare Workers 36
1.1.4.3. Resilience 37
1.1.4.4. The COVID-19 Pandemic 38
1.1.4.4.1. Moral Injury 39
1.1.5. PROVIDING A SAFE SERVICE FOR PATIENTS 40
1.1.5.1. Incidence and Prevention of Medical Error 40
1.1.5.2. Measuring a Safe Environment – The Safety Attitudes Questionnaire 41
1.1.6. PERSONALITY AND ITS ROLE IN HEALTHCARE TEAMS 42
1.1.6.1. Defining Personality 42
1.1.6.2. Understanding Personality 43
1.1.6.3. The Use of Personality Assessments in Healthcare Professionals 46
1.1.6.4. Unanswered Research Questions on the Personality in the Healthcare Environment 47
1.2. AIMS OF THESIS AND RESEARCH QUESTIONS 49
1.3. STRUCTURE OF THESIS 51

2. CHAPTER 2: METHODOLOGY 52

2.1. MIXED METHODS APPROACH 52
2.1.1. QUALITATIVE METHODS 55
2.1.1.1. Qualitative Interviews 56
2.1.1.1.1. Topic Guide for Qualitative Interviews 57
2.1.1.2. Methods of Qualitative Data Analysis 58
2.1.1.2.1. Thematic Analysis 58
2.1.1.2.2. Reflexivity 60
2.1.2. QUANTITATIVE METHODS 61
2.1.3. MERGING QUALITATIVE AND QUANTITATIVE DATA 63
2.2. STUDY DESIGN 63
2.2.1. PROJECT STREAMS 64
2.2.2. RECRUITMENT 65
2.2.2.1. Purposive Sampling Technique 66
2.2.2.2. Thematic Saturation 66
2.2.3. STUDY APPROVALS 67
2.2.4. DATA HANDLING AND STORAGE 67

3. CHAPTER 3: PSYCHOLOGICAL SAFETY IN HEALTHCARE WORKERS: AN EVIDENCE SYNTHESIS 69

3.1. RATIONALE FOR EVIDENCE SYNTHESIS 69
3.2. RESEARCH OBJECTIVES 70
3.3. METHODS 71
3.3.1. PROTOCOL DEVELOPMENT 71
3.3.2. SEARCH STRATEGY 71
3.3.3. SELECTION OF STUDIES AND DATA EXTRACTION 73
3.3.4. SYNTHESIS METHODOLOGY 74
3.4. ANALYSIS AND RESULTS 76
3.4.1. STUDY CHARACTERISTICS 77
3.4.2. ADDRESSING THE RESEARCH OBJECTIVES 84
3.4.3. THEMATIC ANALYSIS 95
3.4.3.1. Influence of Situational Context on Psychological Safety 95
3.4.3.2. Detail on Facilitators and Barriers to Psychological Safety 96
3.4.4. QUALITY APPRAISAL 101
3.5. DISCUSSION 101
3.5.1. LIMITATIONS 104
3.6. CONCLUSIONS AND INFLUENCE ON FUTURE RESEARCH WITHIN PHD PROGRAMME 105

4. CHAPTER 4: ATTITUDES TO SAFETY WITHIN THE CRITICAL CARE ENVIRONMENT AND THE PRESENCE OF PSYCHOLOGICAL SAFETY – A QUALITATIVE INTERVIEW AND QUESTIONNAIRE STUDY 107

4.1. INTRODUCTION 107
4.1.1. RATIONALE FOR STUDY 107
4.1.2. RESEARCH OBJECTIVES 108
4.2. PRELIMINARY WORK: "THE FACULTY OF INTENSIVE CARE MEDICINE WORKFORCE SURVEY – WHAT IMPACTS ON OUR WORKING LIVES" 109
4.3. METHODS 109
4.3.1. RECRUITMENT 109
4.3.2. STUDY DESIGN 110
4.3.2.1. Qualitative Interviews 111
4.3.2.2. Assessment of Psychological Safety 112
4.3.2.3. Safety Attitudes Questionnaire 113
4.3.2.4. Plan for Data Analysis 114

4.3.2.5. Reflexivity 114
4.4. RESULTS 115
4.4.1. ANALYSIS STRATEGY 115
4.4.1.1. Presence of Psychological Safety 116
4.4.1.1.1. Identifying an Environment of Psychological Safety 116
4.4.1.1.2. Influence of Situational Context on Psychological Safety 118
4.4.1.1.3. Negative Consequence of Psychological Safety 121
4.4.1.2. The Safety Attitudes of the MDT in Critical Care 127
4.4.1.2.1. Results 127
4.4.1.2.1.1. SAQ 127
4.4.1.2.1.2. Thematic Analysis 133
4.4.1.3. Impact of the Workplace Environment 138
4.4.1.3.1. Results of Thematic Analysis 139
4.4.1.3.2. Framework for future leaders 144
4.5. DISCUSSION 145
4.5.1. STUDY LIMITATIONS 155
4.6. CONCLUSION 156
4.6.1. OVERALL LESSONS FROM STUDY 156
4.6.2. CONTRIBUTION TO THESIS RESEARCH OBJECTIVES 157
4.6.3. INFORMING FUTURE WORK 157

5. CHAPTER 5: THE INFLUENCE OF PERSONALITY ON PSYCHOLOGICAL SAFETY, THE PRESENCE OF STRESS AND CHOSEN PROFESSIONAL ROLES IN THE HEALTHCARE ENVIRONMENT 159

5.1. INTRODUCTION 159
5.1.1. RATIONALE FOR STUDY 159
5.1.2. HYPOTHESES 160
5.1.3. RESEARCH AIMS 161
5.2. PRELIMINARY WORK: HOW DO CRITICAL CARE STAFF RESPOND TO ORGANSATIONAL CHALLENGE – A QUALITATIVE EXPLORATION INTO PERSONALITY TYPES AND PROCESSING IN CRITICAL CARE 161
5.3. METHODS 164
5.3.1. RECRUITMENT 164
5.3.2. STUDY DESIGN 164
5.3.2.1. Adaptations to Study Timeframes and Methodology 165
5.3.2.2. Administration of 16PF Assessment and Feedback 166
5.3.2.3. Qualitative Interviews 167
5.3.2.4. Quantitative Survey Data 167
5.3.2.4.1. Development Of Clinical Stressors Survey 167
5.3.2.5. Plan for Data Analysis 169
5.3.2.5.1. Analysis Strategy 170
5.3.2.6. Reflexivity 171
5.4. RESULTS – THE INFLUENCE OF PERSONALITY 171
5.4.1. 16PF PERSONALITY DATA 172
5.4.2. QUANTITATIVE SURVEY DATA AND RELATIONSHIP TO PERSONALITY 177
5.4.3. QUALITATIVE THEMATIC ANALYSIS 183
5.5. DISCUSSION – INFLUENCE OF PERSONALITY 189
5.5.1. STUDY LIMITATIONS 194
5.6. RESULTS – LIVED EXPERIENCES OF HEALTHCARE WORKERS ON THE FRONTLINE OF THE COVID-19 PANDEMIC 196
5.6.1. RATIONALE FOR PERFORMING ANALYSIS 196
5.6.1.1. Reflexivity 197
5.6.2. THEMATIC ANALYSIS 197
5.6.3. IMPACT – MAP OF EFFECTS AND POTENTIAL FOR CHANGE 212

5.7. DISCUSSION – LIVED EXPERIENCES OF HEALTHCARE WORKERS ON THE FRONTLINE OF THE COVID-19 PANDEMIC ... 215
5.7.1. STUDY LIMITATIONS ... 217
5.8. CONCLUSIONS ... 218
5.8.1. OVERALL STUDY CONCLUSIONS ... 218
5.8.2. CONTRIBUTION TO THESIS RESEARCH OBJECTIVES ... 219
5.8.3. INFORMING FUTURE WORK ... 220

6. CHAPTER 6: EXPLORING THE WORKING ENVIRONMENT OF HOSPITAL MANAGERS: STRESS, STEREOTYPES, RESILIENCE AND PSYCHOLOGICAL SAFETY ... 221

6.1. INTRODUCTION ... 221
6.1.1. RATIONALE FOR STUDY ... 221
6.1.2. RESEARCH AIMS ... 223
6.2. METHODS ... 224
6.2.1. RECRUITMENT ... 224
6.2.2. STUDY DESIGN ... 225
6.2.2.1. Qualitative Interview ... 226
6.2.2.2. Quantitative Survey Data ... 226
6.2.2.3. Plan for Data Analysis ... 227
6.2.2.4. Reflexivity ... 228
6.3. RESULTS ... 228
6.3.1. THEMATIC ANALYSIS AND FRAMEWORK ... 229
6.3.2. QUANTITATIVE ANALYSIS ... 240
6.3.2.1. Psychological Safety ... 240
6.3.2.2. Resilience ... 241
6.3.3. MAP OF KEY FACTORS IDENTIFIED IN A MANAGER'S WORKPLACE ENVIRONMENT ... 242
6.4. DISCUSSION ... 244
6.4.1. STUDY LIMITATIONS ... 247
6.5. CONCLUSION ... 248
6.5.1. OVERALL STUDY CONCLUSIONS ... 248
6.5.2. CONTRIBUTION TO THESIS RESEARCH OBJECTIVES ... 249

7. CHAPTER 7: FINAL DISCUSSION AND CONCLUSIONS ... 250

7.1. DISCUSSION ... 250
7.2. IMPORTANCE OF THE RESEARCH ... 269
7.2.1. PLAN FOR DISSEMINATION OF RESULTS ... 270
7.3. OVERALL LIMITATIONS ... 271
7.4. OPPORTUNITIES FOR FUTURE WORK ... 273
7.5. CONCLUSIONS ... 275

REFERENCES ... 277

APPENDICES ... 298

Appendix 1. Topic Guide for Qualitative Interview – Attitudes to Safety ... 298
Appendix 2. The Safety Attitudes Questionnaire (120) ... 301
Appendix 3. Qualitative data supporting themes and subthemes that demonstrate the influence of situational context on psychological safety at different levels within the workplace. ... 302

Appendix 4. Qualitative data supporting the themes and subthemes within the negative consequences of psychological safety framework. 305
Appendix 5. Qualitative data supporting the Safety Attitudes thematic framework..... 307
Appendix 6. Qualitative Data supporting the impact of the working environment thematic framework. 312
Appendix 7. Topic Guide for Qualitative Interviews – Influence of Personality 320
Appendix 8. Supporting qualitative data for the influence of personality thematic framework. 322
Appendix 9. Supporting qualitative data relating to the negative consequences of psychological safety..... 335
Appendix 10. Qualitative data supporting the thematic framework for the Impact of COVID-19 on frontline healthcare workers. 340
Appendix 11. Topic Guide for Qualitative Interview – Working environment of hospital managers. 391
Appendix 12. Quantitative survey housing assessment of Psychological Safety and Resilience..... 393
Appendix 13. Qualitative data supporting the thematic framework exploring stress in hospital managers. 394
Appendix 14. Publications 432
Appendix 15. Presentations 433

TABLES

Table 1. Data Extraction Categories 73
Table 2: Summary of Study Characteristics 78
Table 3. Aims of Included Studies 84
Table 4. Evidence of Psychological Safety within each Study. 85
Table 5. Supporting Qualitative Data – Experiences of Psychological Safety. 88
Table 6. Methodologies used to assess Psychological Safety in Healthcare Workers (41) 90
Table 7. Possible Consequences of High or Low Psychological Safety. 92
Table 8. Facilitators and Barriers to Psychological Safety as identified in the Thematic Analysis 98
Table 9. Demographics of Participants 115
Table 10. Mean, mode and interquartile ranges for psychological safety data 117
Table 11. Median, Mode and Interquartile Range (IQR) for all 36 Likert Items. Reverse scored items are shown in italics (a low score for these items corresponds to a safer climate). 127
Table 12. Mean and Standard Deviation Scores for each Caregiver Attitude Climate. 129
Table 13. Results of literature review designed to identify commonly occurring clinical stressors 168
Table 14. Demographics of participants according to department, profession and seniority 172
Table 15. High and low descriptors for each 16 Primary Factor. Adapted by The Sage Handbook of Personality Theory and Assessment (129) with permission from S.R Conn and M.L. Rieke (1994) 16PF Fifth Edition Technical Manual (327) 173
Table 16. Statistical Analysis of 16PF traits – Emergency Department vs Critical Care. 175
Table 17. Ranking of clinical stressors from most stressful to least stressful (all participants, n=58) 177
Table 18. Spearman's Rho Analysis for Clinical Stressor and 16PF personality traits 179
Table 19. Spearman's Rho Correlation for Psychological safety and 16PF traits. 182
Table 20. Demographics of Participants 229
Table 21. The impact of psychological safety on an individual's wellbeing. 266
Table 22. The impact of psychological safety on organisational safety. 266
Table 23. The impact of stress on individual wellbeing and organisational safety. 268

FIGURES

Figure 1. The Job Demand Control Model (figure adapted from Karasek et al 1979 (67)).... 33
Figure 2. Schematic diagram illustrating how data are combined through triangulation..... 54
Figure 3. Schematic diagram illustrating an embedded approach 54
Figure 4. Schematic diagram illustrating the sequence of steps in an explanatory approach 55
Figure 5. Schematic diagram illustrating the sequence of steps in an exploratory approach 55
Figure 6. Outline of project streams within this PhD programme. Arrows indicate where one piece of work informed ongoing study design and ongoing analysis. *Data analysis originated as a consequence of the COVID-19 pandemic, not part of original research plan 65
Figure 7. A PRISMA flow diagram demonstrating the search results, process of screening and selection of studies for inclusion (46, 211)..... 77
Figure 8. A model illustrating the influence of situational context on psychological safety within the healthcare environment (41). 96
Figure 9. A framework illustrating the barriers and facilitators to psychological safety and where they had impact within the workplace (41). 97
Figure 10. Intended plan for triangulation of data from qualitative interviews, the SAQ and psychological safety assessment. 111
Figure 11. Agreement by participants (n=30) with validated statements used to assess psychological safety. (Adapted from published figure (288)) 117
Figure 12. Thematic framework relating to the influence of situational context on psychological safety..... 119
Figure 13. Areas identified within the thematic analysis in which situational context influenced psychological safety within the critical care environment. (Adapted from Figure in published manuscript (293)) 121
Figure 14. Thematic framework constructed from data relating to negative consequences of psychological safety..... 123
Figure 15. Supporting qualitative data exploring the potential negative consequences of a psychologically safe environment (288). 126
Figure 16. Results for the six Likert Scales assessing caregiver attitude climates within the SAQ. 131

Figure 17. Clustered bar chart demonstrating responses to Likert Items consistent with psychological safety..... 132
Figure 18. Thematic framework demonstrating themes regarding staff attitudes to safety. 133
Figure 19. Schematic diagram highlighting the factors that influence a safety climate..... 138
Figure 20. Thematic Framework constructed during the thematic analysis of qualitative data relating to the impact of the workplace environment. 140
Figure 21. Framework demonstrating pathways for identification of increased job demands, areas of low decision latitude and suggestions for improvement of decision latitude (47). 145
Figure 22. Distribution of 16PF STEN Scores in the participant group (Modified from published figure (64)) 163
Figure 23. Triangulation approach to analysing mixed methods data incorporating qualitative interviews, quantitative surveys and the 16PF personality assessment 165
Figure 24. Distribution of STEN Scores on the 16PF assessment for all participants (n=63).174
Figure 25. Comparison between mean STEN profiles for our study population and selected populations within Cattell's 16PF Handbook (133). 176
Figure 26. Variations in ranking of clinical stressors when analysed as all participants, emergency department and critical care. 178
Figure 27. Participant agreement with measures of Psychological Safety (All participants, n=58) 180
Figure 28. Participant agreement with measures of Psychological Safety according to clinical department. 181
Figure 29. Thematic framework with major themes and subthemes regarding the influence of personality. 184
Figure 30. Thematic framework for the negative consequences of psychological safety.... 188
Figure 31. Thematic Framework highlighting major themes and sub-themes constructed during the thematic analysis. 199
Figure 32. A map of the changes in team dynamics and potential psychological effects as a consequence of the pandemic, with suggestions to mitigate these (346). 214
Figure 33. Plan for data incorporation and analysis according to an embedded approach. 225
Figure 34. Thematic framework outlining themes constructed during the thematic analysis. 230

Figure 35. Participant agreement with statements assessing the presence of a psychologically safe environment. 240
Figure 36. Participant agreement with the 6 statements comprising the Brief Resilience Scale. 241
Figure 37. A map highlighting positive and negative contributors to factors that influence the goals of organisational safety and individual wellbeing in hospital managers. 243
Figure 38. Proposed framework for the origin of negative consequences of psychological safety. 254
Figure 39. Themes identified within qualitative analyses on the negative consequences to psychological safety, and implications for individual wellbeing and organisational safety. 255
Figure 40. Composite model demonstrating how situational context can influence an environment of psychological safety. 259
Figure 41. Factors that contribute to an individual's stress in the healthcare environment, according to clinical or managerial roles. 264

ABBREVIATIONS

ANOVA	Analysis of Variance
BRS	Brief Resilience Scale
CASP	Critical Appraisal Skills Programme
CERQual	Confidence in the Evidence from Reviews of Qualitative Research
GDPR	General Data Protection Regulation
FICM	Faculty of Intensive Care Medicine
FMAQ	Flight Management Attitudes Questionnaire
IQR	Inter-Quartile Range
PPE	Personal Protective Equipment
MBI	Maslach Burnout Inventory
NHS	National Health Service
PRISMA	Preferred Reporting Items for Systematic Reviews
SAQ	Safety Attitudes Questionnaire
SPSS	Statistical Package for the Social Sciences
STEN	Standard Ten Scores
UK	United Kingdom
US	United States of America
16PF	16 Primary Factor

GLOSSARY

Burnout	Burnout is a syndrome which results from the chronic and repeated stressors faced by an individual. It can be described as 'lost energy' or 'lost enthusiasm'. It is characterised by depersonalisation, emotional exhaustion and a lack of personal accomplishment (1, 2)
Individual Wellbeing	Individual wellbeing encompasses the environmental factors that affect an individual, as well as how an individual feels about themselves, their sense of purpose and quality of relationships with others. It includes having good mental health, high life satisfaction and an ability to manage stress.
Medical Error	A medical error is a preventable and adverse effect of care. This may be an act of omission or execution that contributes or could contribute to an unintended result. The incidence of medical error may result in patient harm (3).
Multidisciplinary Team	In the healthcare setting, this reflects a group of healthcare workers who are members of different professional disciplines, all providing specific services to the patient.
Organisational Safety	Organisational safety is a measure of how an organisation creates a culture of safety, through behaviours, cultures, systems and leadership (4, 5).
Psychological Distress	The presence of psychological distress refers to the presence of emotional suffering. This is characterised by symptoms of depression and anxiety (6).

Psychological Safety	Psychological Safety can be defined as an environment “safe for interpersonal risk taking”. In a psychologically safe environment, individuals feel free to raise ideas and concerns without fear of negative personal repercussion.
Stress	The term “stress” can be defined as any type of change or challenge that causes physical, psychological or emotional strain.

1. CHAPTER 1: INTRODUCTION

1.1. BACKGROUND

1.1.1. THE PROVISION OF HEALTHCARE WITHIN THE UNITED KINGDOM

The National Health Service (NHS) encompasses the provision of publicly funded healthcare within the United Kingdom. Originally founded in 1948 by Nye Bevan, it has been primarily funded by government taxation since this date, providing efficient and equitable healthcare services to the U.K. population (7). This healthcare system is a multi-faceted and complex organisation, but for simplicity can be divided into primary (provided by general practitioners) and secondary care (the provision of more specialist hospital care). Whilst the NHS provides excellent care to its many patients and is a positive working environment for many of the thousands of individuals who work within it, there are many recognised areas in which the service can be improved. The quest to improve working conditions within the NHS is acknowledged within the academic literature, by healthcare think tanks and the government. Ongoing research into the causes of staff stress and poor wellbeing is warranted to design realistic solutions that will lead to lasting change.

1.1.1.1. Organisational Challenges

There are many challenges associated with the management and operation of a large publicly funded organisation such as the NHS. Funding of NHS services has been an ongoing challenge despite increases in government funding, with the organisation suffering from chronic underfunding at times. This has led to many NHS providers operating with significant deficits in their budgets for long periods of time (7). This funding shortage is exacerbated by rising patient numbers and patient expectations, combined with the increasing availability and complexity of treatments offered. A new 5 year funding deal was announced in July 2018, boosted by additional funding in March 2020 – aiming to improve staff shortages and the provision of primary care appointments (7).

The challenges faced by NHS providers are not limited to funding and resource management, but include the difficulties of recruiting and maintaining a large workforce. The NHS long term

plan (8), published in 2019, set out clear intentions for improvements to the service, with a focus upon improved maternity and child health services, delivering world class care for major health problems and supporting an ageing population. One of 5 points in the delivery plan for these intentions is to improve the strength of the NHS workforce, creating more clinical placements for nurses, more medical school placements and newer apprenticeship routes into the NHS.

The NHS is one of the largest employers in the world. In January 2021 there were 1,327,892 staff working either in hospitals or community services, of which 695,189 were clinically qualified (9). An Interim NHS People Plan was published, stating intentions for how NHS staff can deliver the NHS long term plan (10). The People Plan outlines proposals to tackle staff sickness shortages (generally 2.3% higher than in the rest of the economy) and improve staff retention (with 1 in 11 staff members leaving the NHS entirely each year). The People Plan focuses on ways to make the NHS the "best place to work", through improvements in leadership culture, developing a new operating model for the workforce and urgently addressing the nursing shortage. With the 2018 acceptance rate for nursing courses dropping to 55%, improvement of workforce numbers must tackle both issues with recruitment and staff retention (10).

The NHS People Promise, part of the People Plan for 2020/2021 outlines the aims for an improved working culture – being "positive, compassionate and inclusive" (11). The plan, published in July 2020 outlines actions to support transformation across the NHS with the intention of creating an inclusive and healthy workforce with high levels of wellbeing.

1.1.1.2. Staff Wellbeing Within the NHS

The understanding of staff wellbeing, leading to the development of plans such as the NHS People Promise is informed in part by the yearly NHS staff survey. This survey captures data on several themes, including "Health and Wellbeing", "Morale", "Staff engagement", "Team working" and "Safety". The most recent survey in 2020 captured data from 280 NHS organisations and almost 600,000 individuals (12).

Health and wellbeing data demonstrated that 44% of participants reported "feeling unwell as a result of work-related stress", a steady increase from 36.8% in 2016 and 40.3% in 2019.

Within the morale theme, 71.4% stated they "receive the respect they deserve from their colleagues", a slight decrease from 72.3% in 2019, and 26.5% "often think about leaving the organisation". Only 58.7% of participants "often or always look forward to going to work", a decline from 59.5% in 2019 (12).

Within the safety culture theme more positive results were seen, with 72.5% of participants stating they would "feel secure raising concerns about unsafe clinical practice", demonstrating a steady increase since 2017. Relating to speaking up, 65.6% agreed "they feel safe to speak up about anything that concerns them in their organisation". Experiencing one incident of bullying or harassment from managers in the previous 12 months was reported by 12.4%, analogous to the 2019 figure of 12.3% (12).

The prominence of NHS staff experiencing stress at work combined with an ever-rising proportion of those considering leaving the profession is of concern. To understand why this is occurring, an increased understanding of the dynamics and nature of working relationships within is required. Whilst data on "speaking up" is generally positive there remains room for improvement – almost 28% of participants feeling unable to raise concerns is a sizeable number and will inevitably contribute to the risk of errors and unsafe practice occurring.

The challenges faced by those working within the NHS have been long acknowledged. In the 2002 research summary "Counting the Smiles, Morale and Motivation in the NHS" (13) three main factors which contributed to feelings of low morale and motivation were identified: "whether staff feel valued, their working environment, and resources and pay". The Institute for Healthcare Improvement's white paper "Framework for improving Joy in Work" (14) was developed in response to high reported symptoms of staff "burnout"[1], citing a 2015 study where these were reported by over 50% of physicians (15). The paper takes the view that focusing upon a positive goal – "joy in work" (rather than focusing upon the negatives that individual may face) will lead to the development of "innovative solutions", thereby improving the workplace. It advocates the involvement of staff in improvement science and

1. Burnout Syndrome can be defined as a state of chronic stress, with feelings of physical and emotional exhaustion, cynicism, detachment and a feeling of ineffectiveness or lack of accomplishment (2. Maslach C, Jackson SE, Leiter MP. Maslach burnout inventory: Scarecrow Education; 1997.) There are many methods of assessing individuals for the presence of burnout, the most utilised of which is the Maslach Burnout Inventory (MBI) which identifies three key domains of burnout – 'emotional exhaustion', 'depersonalisation' and 'personal achievement'.

allowing individuals to focus on “what matters to them”. It projects that this will lead to the creation of an environment that is made up of “healthy, happy and productive people”.

1.1.1.3. The Critical Care Environment

The research within this PhD programme explores the themes of individual staff wellbeing and organisational safety, initially focusing upon how phenomena such as psychological safety and stress manifest in the critical care environment. The critical care department is a specialist healthcare environment providing organ support for the sickest patients within the hospital. Patients are classified according to the different levels of care they require between 0 and 3, with those requiring level 3 care requiring respiratory support together with the support of at least 2 other organ systems. It is a highly pressured and stressful environment, requiring high levels of specialist training for those that work within it. Patients are nursed closely, often with 1:1 or 1:2 care, and units typically have between 4 and 50 beds available for patients. Admission to critical care is dependent upon the severity of a patient’s illness, rather than their specific diagnosis (with the exception of specialist units such as cardiac critical cares units) (16). Typically, critical care units within the NHS are “closed units”, meaning senior staff members working within the unit must accept patients under their care. This affords those working within the critical care department an element of control over the timings of patient admissions, and the nature of patients they admit. This, whilst not always achieved, improves the likelihood of having adequate numbers of appropriately skilled staff within the unit during each shift.

The critical care department relies on a well-functioning team to care for its patients, occasionally in time critical situations. Team members must be able to communicate effectively, raise ideas and concerns, and listen to other viewpoints from within the multidisciplinary team. As such, it is a good environment within which to investigate the presence and manifestation of psychological safety, stress and how safe staff perceive their workplace to be. Whilst heightened within the critical care setting, many of the contributory factors (such as high workload and challenging staffing levels) are present in most clinical environments, suggesting that the results of this PhD programme will be generalisable to other healthcare settings. It is anticipated the study of these phenomena will lead to the

identification of areas that are amenable to change, with the intention of improving individual wellbeing and organisational safety.

1.1.1.4. The Emergency Department

The second clinical environment studied within this PhD programme is the Emergency Department, comparing the manifestation of psychological safety and stress with that seen in Critical Care.

There are some key differences between the operation of the Emergency Department and that of Critical Care. Whilst both require highly skilled specialised staff, the patient demographic and style of working is very different. Emergency Departments must be equipped to cope with all patients – from those with minor injuries through to those presenting with severe illness and trauma. Unlike the critical care department, emergency departments have very limited control over the volume and type of patients they admit, potentially creating a more chaotic working environment. Again, to adequately care for patients in the Emergency Department good teamwork, communication and an environment of psychological safety is essential.

1.1.1.5. The Role of Hospital Managers within the NHS

As the NHS has become more specialised and complex, the role of hospital managers has evolved out of an administrative one into one with leadership responsibilities. There are multiple levels of management within the NHS, from leading small clinical units and multi-disciplinary teams, through to department, hospital and network leaders. The increasing number of clinical sub-specialties has also led to the requirement for managers with specific expertise (17).

There are numerous routes into hospital management roles. These include progression from more junior administrative roles, applying for positions in the NHS having gained management experience in other sectors, or by gaining a place on the graduate management training scheme.

Responsibilities of hospital managers vary according to their level of seniority and clinical department, but include promotion of quality of care, driving an improvement culture (18) and ensuring optimal performance of the organisation (19). Often seen as a source of conflict

between clinical staff and those in managerial roles, hospital managers are frequently responsible for large budgets, and ensuring services run as efficiently as possible.

To succeed in their role, hospital managers must have a good knowledge of the healthcare environment, leadership skills, be proficient at enabling and managing change and have good communication and teamworking skills (20).

Hospital managers work in the same healthcare setting as their clinical colleagues however are potentially subject to different stressors and may experience different working relationships to those in clinical positions. As such this participant group has been selected to investigate the themes of psychological safety, teamwork and workplace stress as part of this PhD programme, comparing this with the findings from studies into their clinical colleagues. Hospital managers are an under-researched group, despite their crucial role in the running of the NHS. The identification of modifiable factors that can be changed to improve psychological safety and reduce workplace stress will be beneficial, both for the managerial workforce, but also for their clinical colleagues and the patients they serve.

1.1.2. PSYCHOLOGICAL SAFETY

1.1.2.1. Defining Psychological Safety

Psychological safety is recognised as an essential component in a well-functioning team. Its presence promotes creativity and innovation whilst minimising the risk and impact of errors (21). Psychological safety enhances team performance, team happiness and positive change within organisations, by facilitating and encouraging individuals to speak up and be themselves without a fear of negative personal repercussions (22). The description of psychological safety and understanding of its benefits has been developed over time. The creation of a psychologically safe environment has been utilised within many different workplace settings with the intention of enhancing organisational safety and improving productivity or outcomes.

The first description of psychological safety as a group phenomenon that reduces the interpersonal risk for individuals is present in Schein and Bennis' book "Personal and Organisational change through group methods: The Laboratory Approach", published in 1965 (23). This text explores the benefits of training groups within a human relations laboratory,

finding that a climate of psychological safety will reduce “a person’s anxiety about being basically accepted and worthwhile”.

This concept of reducing interpersonal risk (and subsequently benefiting both the individual and the organisation) is referenced in the eighth of Deming’s 14 points for management, (24) “drive out fear, so that everyone may work effectively for the company”. These 14 principles were designed for mangers to follow with the aim of improving the effectiveness of an organisation.

The description of an environment of psychological safety was further developed in 1990 by William Kahn, depicting a “sense of being able to show and employ oneself without fear of negative consequences to self-image, status or career” (25). Kahn’s paper, entitled “Psychological conditions of personal engagement and disengagement at work” aimed to explore how individuals use “varying degrees of themselves” (including physical, cognitive and emotional aspects) in their performance at work. The study aimed to produce a grounded theoretical framework that would demonstrate how work, and the psychological experiences associated with such work, shape how individuals “present” (or “absent”) themselves during work related tasks.

Two concepts were developed – “personal engagement” and “personal disengagement” to describe the behaviours of individuals within their working role. Through two qualitative studies, involving interviews and observations, Kahn created a collection of these engagement and disengagement experiences which included descriptions of behaviours, internal experiences and implicated contextual factors (25). Through this analysis, three key questions were described as being asked by participants when considering their ability to engage with working roles. These were “How meaningful is it for me to bring myself into this performance?”, “How safe is it to do so?” and “How available am I to do so?”.

The analysis also demonstrated that psychological safety, an environment in which individuals would not suffer as a consequence of personal engagement, was crucial for self-expression and engaging in the process of change.

Building upon the identification and description of this environment, four factors were elicited that directly influenced a climate of psychological safety. These were the presence of

supportive interpersonal relationships, group dynamics, a clear and supportive management style and organisational expectations.

In 1999 the concept of psychological safety as a team level construct was developed further through research by Amy Edmondson, through an exploration into what features are present in high functioning teams. In this paper the construct of "team psychological safety" is introduced, alongside the definition that this is a "*shared belief held by members of the team that the team is safe for interpersonal risk taking*" (26). To define psychological safety as a group-level construct, all team members must possess similar perceptions of it. This study of work teams observed real world behaviours (unlike previous studies in human laboratory settings), using a combination of qualitative and quantitative techniques. Several hypotheses linking psychological safety, team performance and learning behaviours were tested: examining their relationships, the antecedents to psychological safety and the potential outcomes. With respect to psychological safety, the data described a shared belief within the team that individuals will not be blamed by one another and will be relied upon to help each other. High performing teams were identified as ones who were willing to report mistakes, thereby encouraging learning behaviours and subsequently improving outcomes. The study concludes that a climate of psychological safety will promote performance in work teams. Data obtained in this study were also used to develop scales measuring team psychological safety, learning behaviour and team efficacy. The scale used to assess psychological safety has been validated and has been used to evaluate psychological safety in many subsequent research studies (26).

Psychological safety has also been demonstrated to be beneficial at both the individual and organisational level, in addition to its benefits for the team (27). A systematic review of the literature categorised published data according to their level of analysis – individual, group and organisation (28). At an individual level, psychological safety was shown to create proactive, creative and engaged individuals, leading to trusting relationships and sharing of information. It also highlighted that speaking up and employee voice behaviours had a positive relationship with psychological safety.

At the organisational level relationships between psychological safety, commitment based human resources practices, high quality relationships, a climate for initiative and organisational performance were identified.

1.1.2.2. The Importance of Psychological Safety

There are many notable examples within the literature demonstrating how crucial psychological safety is in creating a safe and effective workplace.

An early example of the effective creation of a psychologically safe workplace was demonstrated by the Toyota Production System. This system utilised a culture of psychological safety, allowing and encouraging staff to highlight errors in production. This was done by pulling an "Andon cord"[2], which would stop the production line and draw attention to a potential issue within the workstation. The success of this measure in creating a safety culture and promoting good quality outputs is attributed to staff feeling that this behaviour was encouraged by the organisation, and that "pulls" of the Andon cord were expected (29).

Another huge proponent of the importance of psychological safety was a 2013 project by Google, entitled "Project Aristotle". The aim of this project was to establish what key factors were different between high and low performing teams. The project was completed over 2 years, and explored group dynamics, individual skill sets, personality traits and emotional intelligence. Five key dynamics were elicited during the data analysis, with the presence of psychological safety listed as the most important variable in a highly functioning team (30).

There are also important examples of how a lack of psychological safety can have disastrous consequences. The two fatal accidents associated with Boeing 737 Max jets have been linked to a lack of psychological safety in Boeing employees, with individuals fearful of losing their jobs if they raised concerns (31). The nuclear power accident in Chernobyl has also been associated with poor psychological safety with employees feeling unable to speak up about their concerns (32). Whilst these are extreme examples of the potential consequences of a lack of psychological safety within the working environment, they serve well to highlight its

2 "Andon" is a Japanese word describing the traditional lighting equipment of a lantern made from paper and bamboo. This idea was translated and used for manufacturing processes, with the term "Andon" becoming a signal used to highlight an anomaly or concern.

importance. There are many other examples of a psychologically safe climate being created to improve safety and organisational productivity, such as at Alcoa (an aluminium manufacturer), where all employees were encouraged to raise concerns and ideas leading to a huge improvement in the market value of the company (33).

1.1.2.3. Antecedents of a Psychologically Safe Environment

Following the definition of psychological safety as a concept and acknowledgement of its importance in many settings, much has done to explore and quantify the antecedents to a psychologically safe environment, and how this knowledge can be used to promote it. Frequently cited antecedents include the presence of supportive management and clarity for individuals regarding organisational expectations (22, 25).

Differences in professional status and an individual's position within a team's hierarchy are important antecedents of psychological safety (34), with flatter hierarchies promoting this environment. Leader inclusiveness has been demonstrated to be crucial in reducing the impact of hierarchy or status and improving collaboration by dictating team dynamics and the team's culture (35).

The interaction of an individual with their environment is important for the manifestation of psychological safety, with the assessment they make of their surroundings profoundly affecting their subsequent behaviour (36).

A 2017 meta-analysis on the antecedents and outcomes of psychological safety (37) explored this at the group and individual level. Individual level antecedents included the presence of a proactive personality, openness to experience, positive leader relations (incorporating inclusive leadership and trust in leadership), autonomy, role clarity and peer support.

Antecedents of psychological safety identified at a group level were similar, including a supportive work context (with peer and organisational support), positive leader relations and good work design characteristics (such as autonomy and interdependence).

Another review identified 44 empirical studies that had investigated the antecedents of psychological safety at the three different levels of analysis within the organisation. This review again highlighted the significant of organisational practices, leadership, inter-team relationships and individual differences (38).

1.1.2.4. The Significance of Psychological Safety in the Healthcare Environment

The presence of psychological safety within the healthcare environment is beneficial in several ways and should not be underestimated. Firstly, it assists in the minimisation of medical error and near misses through the promotion of speaking up and employee voice[3]. Secondly, it can improve both system processes and patient care by facilitating innovation such as the development of new treatment pathways and policies (21, 40, 41).

Traditionally, healthcare teams have operated under a strict hierarchy (42). Whilst much work has been done to flatten this (through dedicated non-technical skills training (43) and improvement of communication skills (44)) it is still a contributing factor to medical error (45). Psychological safety allows those in junior positions (often the individuals most acutely aware of potential safety issues) to speak up. It fosters a culture where healthcare workers will raise safety concerns as they arise, because they aren't concerned about the potential negative personal consequences. In such a culture an individual will feel confident that the organisation will listen to and act upon such concerns, irrespective of who within the "hierarchy" raises them (46).

Medical error rates remain high both within the UK and worldwide (47, 48). In addition, healthcare staff report ongoing dissatisfaction with their working environment– a recurring theme within the annual NHS staff survey (12, 49). The delivery of high quality healthcare requires the integration of multiple skill sets and experience – consequently healthcare teams will consist of multiple individuals with specific expertise and skills (46).

Communication is frequently implicated as a causative element in a high proportion of medical errors. A 2015 report on malpractice claims in the United States (U.S.) (50) implicated communication failure in 30% of all malpractice claims and 37% of high severity injury cases) (46). High levels of psychological safety have clear benefits for patient safety by improving the delivery of clinical care. In addition, it also improves the health of the workforce by promoting job satisfaction & well-being (13, 14) (46).

3 The term 'Employee voice' reflects an employee's ability to speak freely, communicate their views and raised concerns about their organisation
(39. Ruck K, Welch M, Menara B. Employee voice: an antecedent to organisational engagement? Public Relations Review. 2017;43(5):904-14.).

A cross-sectional survey study comparing error, stress and teamwork in medicine and aviation found that 50% of intensive care staff reported difficulty in discussing mistakes, and that error was not handled well by managers at their hospital (42). A similar study (51) found that physicians and nurses perceived their working environments differently, with nurses finding it more difficult to speak up than physicians (52). Communication and speaking up can also be affected by an individual's national culture if challenging those in senior positions is not regarded as being culturally acceptable (37, 53). Organisational culture is also important - a study comparing Japanese and U.S. residents when questioning authority concluded that organisational culture was more significant in reducing barriers to speaking up than an individual's national culture (54).

The antecedents to psychological safety within the healthcare environment are similar to those described in other settings. A systematic review on the antecedents to psychological safety within the healthcare environment (55) found two key major themes: "leadership behaviours" (including leader inclusiveness, trustworthiness and ethical leadership) and "network ties" (reflecting the importance of past and current interactions between individuals).

Despite the longstanding acknowledgement and understanding of the importance of psychological safety within many industrial settings, the healthcare quality improvement and patient safety spheres, it is rarely found within the curriculum for medical education (56). This may indicate that many of those working within the healthcare setting do not actively cultivate such an environment or are not aware of its significance. By improving the understanding of the antecedents to psychological safety in the healthcare setting, and the influence of psychological safety on outcomes such as staff wellbeing and safety culture, this may help promote the importance of education regarding psychological safety. This will ensure future team leaders are well equipped to foster such an environment.

1.1.2.5. Unanswered Research Questions on the Topic of Psychological Safety

Two large systematic reviews summarising the existing literature on psychological safety and suggest directions for future work on this topic. Newman et al (38) raise the following points as requiring further investigation:

- An exploration of how psychological safety can influence positive and negative work outcomes; and the conditions that affect this relationship.
- Further investigation into the measurement of psychological safety.
- Greater investigation into the potential negative effects of psychological safety.
- More research to understand the relative influence of individual, group and organisational level antecedents on a climate of psychological safety.

Edmondson's 2014 review (28) also suggests topics for future research into psychological safety, including:

- Examining the dynamic nature of and influences on psychological safety.
- Testing potential "boundary conditions"[4] for the effects of psychological safety.
- Explore the influence of cultural conditions on psychological safety.
- Provide further research to enhance the credibility and generalisation of current findings.

Whilst much is already known about psychological safety, these reviews highlight the opportunity for ongoing research particularly when considered in specific workplace environments such as healthcare. This can be refined further to evaluate psychological safety in specialised workplace environments within the healthcare setting, such as critical care or the emergency department.

1.1.3. THE WORKPLACE ENVIRONMENT

Exploring the aetiology and impact of stress on healthcare workers is a primary aim of this PhD programme. A focus of this exploration will be the interaction between an individual worker and the environment they work in.

4 "Boundary Conditions" are often discussed within the psychological safety literature. Boundary conditions refer to the "who, where, when aspects of a theory" and describe the limits and generalisability of a theory. 57. Busse C, Kach AP, Wagner SM. Boundary conditions: What they are, how to explore them, why we need them, and when to consider them. Organizational Research Methods. 2017;20(4):574-609.

1.1.3.1. Concept of the Workplace Environment

The concept of the workplace environment is broad, encompassing the immediate physical setting that an individual works in addition to job characteristics, organisational features and extra-organisational aspects (such as the ability to achieve a satisfactory work-life balance) (58). When considered in the context of healthcare, the workplace environment includes the layout and physical ergonomics of the ward, workload and available resources, shift patterns and how well the team integrates and works together.

It is inevitable that the workplace environment and an individual's interactions with its components will have a both a physical and a psychological impact on the individual themselves. This psychological impact may be positive or negative, and can influence an individual's affect, cognition and subsequent behaviours. This can be more difficult to quantify than potential physical consequences of a working environment, such as back pain or injury (52, 59).

1.1.3.2. The Impact of the Workplace Environment on Individuals

There are two factors to consider when exploring the impact of the workplace environment. Firstly, this impact is influenced by the interpretation a worker makes regarding their surroundings. Secondly, it may be a consequence of the combination of a number of conditions (such as a heavy workload in conjunction with poor staffing), rather than one isolated factor (52, 58).

The data highlighted in 1.1.1.2 demonstrate that NHS staff face organisational challenges and stress that may be detrimental to their well-being and job satisfaction. The reported challenges in these data correspond to stressors identified within literature - including heavy workloads (60) and difficult shift patterns (61). Personal factors specific to each individual worker also contribute, including perceived "burnout", personality and family/work conflicts (62).

If contributing factors within the workplace environment are not managed (and ideally optimised) they can be implicated as causative factors in the development of negative psychological consequences. For example, an understaffed workplace inadequately equipped to manage the incoming workload can lead to staff members being forced to work outside of

their comfort zone, leading to feelings of being “unsafe” (both in terms of patient and staff safety) (63, 64). This sense of being “unsafe” can precipitate negative psychological consequences, particularly if endured over a significant period of time.

There is a significant body of research looking at the impact of the physical layout of the working environment within the healthcare setting, with a particular focus upon the consequences of nursing patients in single rooms. These studies are often focused in a general ward setting, and generally from the viewpoint of the patient – both in terms of patient experience and patient safety (52).

Single patient rooms are acknowledged to reduce hospital acquired infections and improve patient care (65). Patient benefits include increased privacy, reduced length of stay, better family interactions and reduced stress (as a result of being away from a noisy ward environment) (66). There are some negatives associated with single rooms which generally affect staff members, particularly in critical care where staff are isolated within patient rooms for prolonged periods of time. These include a lack of informal conversation with colleagues, reduction in patient visibility (if nursing more than one patient), reduced teamwork, difficulties in prioritisation and increased distances walked for nurses. (52, 67-69)

The benefits of a properly designed environment for staff are multiple, including reduced back pain and work-related injuries, reduced injuries from medical equipment and reduction in noise stress (52, 59). The workplace environment being studied in depth within this PhD programme is critical care, a setting not represented within existing literature on the impact of the workplace environment. The critical care environment is distinct from the ward environment in several ways. Firstly, the nursing ratios differ – meaning that it is unusual for critical care nurses to be delivering greater than 1:1 or 1:2 care. Secondly, patients requiring critical care have significantly higher medical demands, influencing both their medical and social needs (16).

A Cochrane review (70) looked at the psychological effects of physical design in the clinical environment, the conclusion of which was that “ideally the environment should support the needs and preferences of both groups” – patients and staff. Only one study was included in this review due to the paucity of randomised control trials or controlled clinical trials in this field, highlighting the need for ongoing research in this area. A systematic review of

observational studies (71) investigated the association between job stress and health outcomes (such as the presence of cardiovascular disease), leading to a call for more research to examine these models in specific work environments (52).

1.1.3.3. The Job Demand Control Model

The Job Demand Control model was developed by Karasek in 1979, in order to clarify previous contradictory findings regarding how job demands interacted with an individual's decision latitude (72), and how this can result in job strain. Job demands are defined as "*stress source*"" and are an independent variable within this environment. Decision latitude is defined as "*the working individual's potential control over his tasks and his conduct during the working day*"(72). These two measures are brought together in the model to create a composite measure – "job strain". The model (Figure 1) illustrates that workers are at highest risk of mental strain & negative psychological outcomes when they are faced with significant workload and demands combined with low decision latitude (72). The ideal scenario within this model is a role that has high job demands combined with high decision latitude – thereby giving an individual the greatest possible sense of fulfilment and job satisfaction.

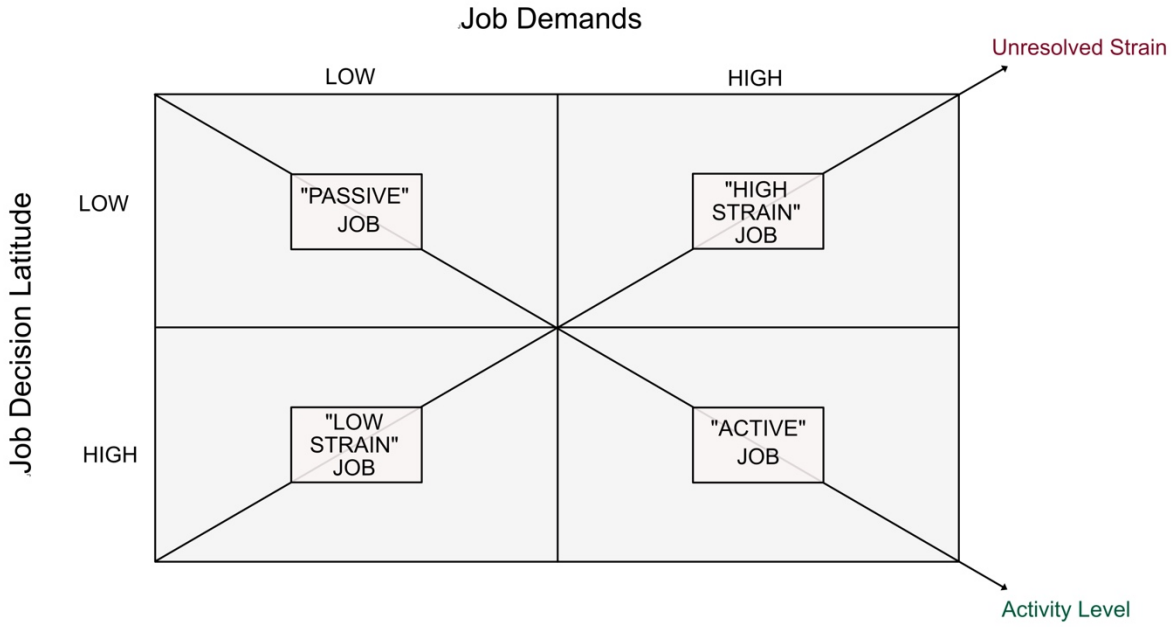


Figure 1. The Job Demand Control Model (figure adapted from Karasek et al 1979 (67))

This model has been explored both in and outside the healthcare environment. Data collected from employees in industry indicated a positive relationship between the working environment and job satisfaction (73). Notably, it is not the workload or demands themselves that are detrimental, but the level (or lack) of control felt by the individual worker (52).

This model has been explored within healthcare workers, with multiple studies supporting its use in this context. High job strain (the combination of high demands and low decision latitude) was found to be detrimental in a survey of 289 nursing staff (74), leading to emotional exhaustion and job dissatisfaction. Another study (75) found that when staff had little control over their work demands this led to negative physical consequences for the staff (relating job strain to higher blood pressure). A study of 249 nurses and nursing assistants validated this model in healthcare (76), making several conclusions, including that "high levels of autonomy attenuate the increase of emotional exhaustion due to job demands" (52).

A supportive workplace environment will lead to employees who are more committed to the organisation and reduce their risk of experiencing job strain. Workplace characteristics that promote low job strain include access to appropriate information, resources and support (77, 78).

This model is useful as a framework for exploring the workplace environment in multiple ways. Firstly, it aids in the identification of stressors that lead to job strain and highlights how they interact with factors relating to an individual's perceived control. By identifying the mechanisms that lead to high levels of strain and psychological distress, the workplace environment may be re-engineered to reduce the impact of such factors and promote employee wellbeing and job satisfaction.

1.1.4. WORKPLACE STRESS IN THE HEALTHCARE ENVIRONMENT

1.1.4.1. Contributors to Stress

The aetiology of stress felt by staff in the healthcare environment is often multifactorial. Some factors that have been implicated in contributing to the stress felt by healthcare workers include an individual worker's high expectations of themselves, the nature of the work itself and a lack of adequate time or resources to do the job well (79). The prevalence of stress in healthcare workers is high, with a 2003 study (80) finding that stress claims in the healthcare

industry are almost double that seen in other industries, with the highest proportion of claims arising from nursing staff.

Several studies have explored the presence and causes of stress within the clinical setting, often yielding similar findings. A questionnaire study in Taiwan (81) investigated for differences in stress, depression and intention to leave the profession in nurses working in various clinical departments, finding that the particular department they worked in was related to the level of stress and depression felt. In addition, personal factors (such as level of experience and personal relationships) also affected the presence of stress, depression and intention to leave. Another questionnaire study (82) identified that both organisational factors (including workload, control, community and values) and personal factors (such as personality, job satisfaction and mental health) were related to work engagement and the risk of work-related psychological problems.

A study exploring occupational stress in critical care implicated “facing death”, “answering emergency calls” and “caring for critically ill patients” as the main stressors for nursing staff (83). A study in doctors referenced excessive workload, long hours and handling unexpected responsibilities as stress inducing (84). A survey designed to identify the most intense stressors for those in secondary care found participants experienced stress relating to workload, an inadequate working environment and out-of-hours working commitments (85). Concerns regarding staff retention often predominates in these studies, with a cross-sectional study (86) finding that “work-family conflict”, “family variables” and “job control” were the strongest predictors of a nurse’s intention to leave their profession.

A large Cochrane review investigating measures to prevent occupational stress in healthcare workers included 58 studies covering 7188 participants (79). Of these 58 studies, 54 were randomised control trials. Interventions to reduce stress were categorised into “cognitive-behavioural training”, “mental and physical relaxation” and “organisational changes”. The review found that moderate reductions in stress could be achieved with cognitive-behavioural training or relaxation techniques. This review concludes that organisational interventions “*need to be better focused on addressing specific factors that cause stress*”. To do this each clinical department must regularly assess for the presence and aetiology of stress, facilitating the development of bespoke solutions and implement lasting change.

1.1.4.2. Consequences of Stress in Healthcare Workers

Management of stress in staff members is important, as the occurrence of states of chronic stress can lead to significant psychological sequelae such as burnout syndrome. Burnout Syndrome can be defined as a state of chronic stress, with feelings of physical and emotional exhaustion, cynicism, detachment and a sense of ineffectiveness or lack of accomplishment (2, 87). There are many methods of assessing individuals for the presence of burnout, the most utilised of which is the Maslach Burnout Inventory (MBI) (2), which identifies three key domains of burnout – emotional exhaustion, depersonalisation and personal achievement.

The process of making difficult and ethical decisions can place such strain on physicians and nurses that it can lead to the occurrence of burnout, with the sub dimension of emotional exhaustion often being most prevalent in this scenario (88). Positively, clinical staff often score highly in the section regarding personal accomplishment (89), thereby demonstrating the fine balance between burnout and job satisfaction that occurs within the medical field. This links into the concept of the job demand control model (72) – corroborating that high job demands are not detrimental, but that it is the lack of control over the workload that can lead to strain.

In addition to Burnout Syndrome, stress can lead to the presence of other negative manifestations such as anxiety, depression and psychological distress (90).
Increasing numbers of staff members exhibiting psychological distress is detrimental not only for these individuals but may impact on patient care. It also has negative implications for staff retention and workforce longevity. Research has demonstrated that burnout symptoms may be more prevalent in healthcare workers than their counterparts in other similar professions (91). This has led to initiatives in both the development of resilience strategies and mindfulness workshops (92) with some encouraging preliminary results.

It is not just frontline healthcare staff who are affected by stress and psychological distress related to the clinical environment they work in. Healthcare managers also face increasing job demands and are often more acutely aware of the financial constrains within which the NHS must operate.

There have been limited investigations into psychological distress within NHS managers. Existing studies tend to focus upon managers who have a clinical role (such as clinical lead for a department), rather than those with non-clinical backgrounds or those who have purely managerial roles. Within these limited studies on nursing managers, the presence of burnout within managerial staff has been associated with increased job strain, consequently leading to increased turnover intention and a reduction in commitment to the organisation (93).

1.1.4.3. Resilience

Resilient individuals can withstand repeated challenges and stressful events whilst minimising the risk of negative personal consequences. In the context of exploring the manifestation and aetiology of stress within healthcare workers, this PhD programme investigated the presence and development of resilience as a consequence of such stress in hospital managers.
Resilience is often referred to as the ability to "bounce back" from hardship and adverse circumstances (94), although a universal definition was not identified in a review of 100 articles on the topic (95). The review identified common themes across papers exploring resilience, including "rising above", "adaptation and adjustment" and "dynamic process". Another review in 2011 (96) identified that a key component of resilience is "*positive adaptation, or the ability to maintain or regain mental health, despite experiencing adversity*".

It is important for leaders within the healthcare setting to be aware of and promote the development of resilience, thereby facilitating workforce well-being and longevity. An integrative review of resilience in nursing staff identified 7 papers addressing the topic (97). The review found that challenging workplaces and a sense of dissonance would negatively affect resilience, with factors associated with building resilience including "cognitive reframing", "toughening up", "critical reflection and reconciliation" and a "good work-life balance".

Resilience has been acknowledged as important in many industries and businesses, with a Harvard business review article highlighting that resilient people can "face and accept reality", "find meaning in challenging times" and "improvise in order to deal with evolving situations" (98).

The possession of high levels of resilience is beneficial for healthcare teams in numerous ways. Firstly, having a resilient workforce can improve staff engagement, allowing them to provide the best possible patient care by facilitating innovation and an ability to deal with challenges. It will also help minimise any intention to leave the profession, thereby helping to maintain a happy and effective workforce.

Multiple scales have been designed with the intention of measuring resilience. A 2011 review analysed 19 resilience measures (99). This review did not identify one scale as being a gold-standard for the measurement of resilience but ranked the scales according to a quality assessment. The top-ranking scales included the Connor-Davidson Resilience Scale (CD-RISC), which measures resilience as a function of 5 inter-related components (personal competence, acceptance of change, trust, control and spiritual influences). The Resilience Scale for Adults (RSA) (100) also ranked highly. This is a self-report scale that again evaluates the presence of factors that contribute to highly resilient individuals, including social support and family coherence.

The Brief Resilience Scale (BRS) also ranks highly in the review's quality assessment, however differs in its approach to the assessment of resilience. Whilst the CD-RISC and RSA measure the presence of factors that build resilience, the BRS is a self-rating questionnaire assessing an individual's ability to bounce back from stress (101). This differing perspective on assessing resilience is felt to provide valuable insights on how individuals cope with stressors (101). This is particularly useful when considering resilience in the context of a highly stressful environment, and in identifying individuals within the team that may require increased support.

1.1.4.4. The COVID-19 Pandemic

In March 2020, the effects of the COVID-19 pandemic were becoming evident in the United Kingdom. Increasing numbers of patients requiring treatment for the disease began having a significant impact on healthcare services, with hospitals facing a rapid influx of critically unwell patients. By December 2021, a total of 633,613 patients had been admitted to hospital, with the majority of these admissions occurring within the first two waves of the pandemic in April 2020 and January 2021(102).

This had a significant impact upon staff working on the frontlines in hospitals, with several quantitative survey studies and review papers highlighting increasing levels of negative psychological sequelae such as anxiety, depression and occupational stress (103-106).

The NHS has been impacted in significant ways in addition to the immediate requirement to manage COVID-19 patients. Diversion of resources to manage the crisis affected other clinical services, meaning staff are now required to manage long waiting lists and a backlog of care, alongside ongoing COVID-19 pressures.

Increased funding for NHS services has been promised by the U.K. government in response to the pandemic in the form of £50 billion to help with the provision of essential equipment and boost capacity (7). The longer-term impact of the pandemic and its associated pressures on staff wellbeing and stress remains to be seen, however it is likely to compound and magnify existing problems seen with burnout and staff retention.

1.1.4.4.1. Moral Injury

The prevalence of moral injury in healthcare workers was highlighted during the COVID-19 pandemic. The term "moral injury" represents the potential negative outcomes following the transgression of values and beliefs that are deeply held (107). Experiences that cause moral injury are defined as "*perpetrating, failing to prevent, bearing witness to, or learning about acts that transgress deeply held moral beliefs and expectations*" (108). First observed in war veterans, these experiences can lead to dissonance and internal conflict – ultimately creating profound psychological distress (109).

Moral injury comprises a constellation of symptoms including post-traumatic stress symptoms and depressive symptoms (110). The hallmarks of moral injury have been described as "guilt, shame, anger and disgust" (107), all relating to the morally injurious event. Research into the impact of moral injury on frontline staff has highlighted its existence in this group (109, 111, 112) – likely driven by lack of resources, tremendous workload, high stress and uncertain working conditions. The morally injurious event in healthcare workers is typically a scenario in which individuals are faced with an inability to provide an acceptable level of care for their patients. Ongoing research is required to understand the exact aetiology of moral injury in healthcare workers, its consequences and what can be done to mitigate it in the future.

1.1.5. PROVIDING A SAFE SERVICE FOR PATIENTS

1.1.5.1. Incidence and Prevention of Medical Error

Patients presenting to NHS requiring medical attention reasonably expect that their care will be delivered without error or accident. The goal of minimising medical error and providing safe care to all patients is at the heart of every medical department and clinical service, with many initiatives and safeguards in place to achieve this. These include an increased emphasis on the importance of error reporting and changes in team communication, aiming to minimise a blame culture (113). The Joint Commission Patient Safety goals include measures such as "confirming patient identity in two ways" and "preventing infection through handwashing and central line precautions" (114).

A landmark book, "To Err is Human: Building a Safer Health System" published in 1999 by the Institute of Medicine (115) quotes the 1997 statistic that up to 98,000 Americans die in hospital each year as a consequence of medical error. This text also addresses the problem of loss of public trust due to medical errors, and that healthcare practitioners can suffer loss of morale and frustration at being unable to deliver care to the standards they would like to. The publication of this book sparked a significant increase in both the investigation of medical error and an improved understanding of how medical error occurs. A subsequent systematic review (116) of the patient safety literature demonstrated that following publication of the report organisational culture was the most frequent subject of patient safety publications (in comparison to malpractice being the most frequent subject prior). The raised profile of patient safety as a consequence of "To Err is Human" has been credited as significantly improving patient safety, particularly in reducing hospital acquired infections and medication errors (116).

Despite initiatives to prevent medical errors and an increased understanding of their aetiology, they continue to occur (117). A systematic review in 2018 incorporated 8 studies looking at intravenous medication errors, finding a weighted mean of 101 errors per 1000 administrations (118). An economic analysis in 2021 estimated that 237 million medication errors occur annually, of which 66 million have the potential to be clinically significant and cause harm to patients (119).

Inadequate communication between healthcare providers has been identified as contributing to a significant proportion of incidents (48). To create a safe environment, staff must work together to achieve optimal communication, delivery of care and sharing of ideas. This explains why psychological safety is so crucial within the healthcare service – without the ability to freely raise concerns, highlight near misses and illuminate potential errors, it is inevitable that errors will occur.

Psychological safety is also important for organisational learning – so that errors can be learnt from by all those working within the clinical environment. If they are not raised and simply corrected by the individual, then it is difficult to implement pathways and solutions to ensure they do not recur (37).

1.1.5.2. Measuring a Safe Environment – The Safety Attitudes Questionnaire

There are several methods for measuring how safe a clinical environment is for patients and the staff which work within it. These can be based upon outcomes, for example data regarding rates of medical error or levels of incident reporting, or can be based upon an assessment of the culture within the clinical environment.

Given the increasing acknowledgement of the importance of organisational culture and staff behaviours in reducing medical error, it is possible to measure a safety culture by assessing whether staff perceive one to be present. The Safety Attitudes Questionnaire (SAQ) is a validated tool for the assessment of healthcare provider attitudes to safety culture (120). Developed in 2006, it measures caregiver attitudes over six patient safety domains, thereby eliciting a snapshot of safety culture. The SAQ has many applications - it has been used to assess the efficacy of safety interventions (such as implementing executive walk rounds (121)), and can be adapted for use in different clinical environments (for example, critical care or a surgical department). The SAQ is derived from a questionnaire used widely in commercial aviation, the “Flight Management Attitudes Questionnaire” (FMAQ) (122). The FMAQ was developed following the realisation that many airline accidents had breakdown in the interpersonal aspects of crew performance (such as teamwork and speaking up) as contributory factors.

The SAQ was developed using relevant FMAQ items and expanded upon these through discussion with healthcare providers and subject matter experts, initially leading to the creation of a 100-item survey. Following refinement and development, the SAQ consists of 60 factor-analytically derived items relating to six climate scales. These are "teamwork climate, safety climate, job satisfaction, perceptions of management, working conditions and stress recognition" (123). There is also a short form of the survey available, incorporating 36 key items.

The SAQ has been applied successfully in many clinical environments worldwide, establishing its reliability and validity in assessing caregiver attitudes to safety (124-126). The questionnaire provides valuable insights into the interpersonal relationships and culture within the department studied, allowing leaders to identify areas in which to target change.

1.1.6. PERSONALITY AND ITS ROLE IN HEALTHCARE TEAMS

The response of critical care staff to organisational challenge was investigated prior to this PhD programme by our research group (a summary of this work is presented in Chapter 5.2). A qualitative study exploring the response of healthcare workers to a hypothetical challenging situation identified the presence of different behavioural groups and patterns of cognitive processing in the participants (63). A second study built on this analysis, highlighting differences in cognitive processing and evidence that the predominant personality types within this group differed from general population norms (64). As such, it was hypothesised that personality would have an influence on the presence of stress and psychological safety in healthcare workers, and that different individuals may be attracted to different working environments. This was therefore identified as an area that warranted further research.

1.1.6.1. Defining Personality

Personality can be defined as *"the combination of characteristics or qualities that form an individual's distinctive character"* (127). This refers to the pattern of thoughts, feelings, social adjustments and behaviours which are consistently exhibited over time by an individual. It is these behaviours, thoughts and feelings that are said to make an individual unique.

There are many differing theories and research concepts within the field of personality psychology, even down to agreement on a definition of personality itself (128). A more recent definition attempts to bring together some of the arguments and myths about personality (such as the idea that the study of personality equates to the study of the whole person, rather than simply an aspect of an individual). This definition is as follows: *"an individual's personality is the enduring set of Traits and Styles that he or she exhibits, which characteristics represent (a) dispositions (natural tendencies or personal inclinations) of this person and (b) ways in which this person differs from the "standard normal person" in his or her society." (128)*.

Whilst there is no unifying definition or agreement on how personality develops or can be classified, there are commonalities across the different perspectives. An individual's personality will influence their behaviour, particularly under times of challenge when coping mechanisms and learnt behaviour are more difficult to utilise. Personality will influence how individuals interact with those around them, and their response to stressful events. As such, regardless of how it is measured or defined, the study of personality is useful to understand more about how individuals behave in specific environments. In healthcare, this can be used to understand how personalities within the team can interact and impact the wider team and department.

1.1.6.2. Understanding Personality

Several techniques have been used in the study of personality, including clinical observation and case studies, self-report methods, experimental methods and clinical research. This has led to the creation of multiple personality theories, relating the development of personality to genetics, biological processes, conditioning by the environment and childhood experiences (129). The major theories can be grouped into "biological", "behavioural", "psychodynamic", "humanist" and "trait" (130).

Trait theory is one of the most prominent areas within personality psychology. This theory centres upon the identification, measurement and description of specific traits that comprise an individual's personality, highlighting differences between individuals (131).

Three key perspectives within the broader umbrella of "trait theory" have been developed. In all these, each personality trait represents a range of potential behaviours between two extremes, with the majority of individuals being somewhere within the mid-range for each trait. Hans Eysenck (132) used a factor analysis technique to develop a theory stating that there are three dimensions of personality – "extraversion-introversion" (reflecting social interactions), "neuroticism" (relating to emotional reactions and anxieties) and "psychoticism" (relating to control). This theory focused upon an individual's temperament and proposed that personality differences were controlled by genetic influences.

Raymond Cattell built upon existing factor analytic techniques to develop a broad based descriptive theory of personality (133, 134). He identified 16 different fundamental components of personality, and developed the 16 Primary Factor (16PF) questionnaire, arguing that was necessary to look at a much larger number of traits in order to build a more complete picture of an individual's personality (135). This is a well validated assessment, providing a standard ten score between 1 and 10 for each of the 16 personality traits.

The five-factor theory of personality identifies five key dimensions of personality: "Openness", "Conscientiousness", "Extroversion", "Agreeableness" and "Neuroticism". This "big 5" theory first emerged in 1949 (136), and has been expanded upon in subsequent research. It is popular as it simplifies Cattell's 16 primary factor model, whilst providing more depth than Eysenck's 3 factor theory.

There are multiple validated methods of assessing personality. These methods differ according to the personality theory they are based upon (for example, trait vs type). The Sixteen Primary Factor Questionnaire (16PF) is based upon trait theory and has been validated across different cultures and countries. A participant completes a 160-part questionnaire, and their scores are compared to "norm" data to generate their score for each trait.

The 16PF British Supplement of Norms (137) was created from testing a random sample of individuals (all required to be literate and between the ages of 16-70). Individuals were selected at random from a representative sample of 200 parliamentary constituencies within the United Kingdom. Whilst this sampling was intended to be random, it is acknowledged that

adults must be willing to participate in the research – therefore true random sampling is virtually impossible.

All personality assessments rely upon the honesty of the candidate when providing reflections of their behaviour. The 16PF protects against unconscious or conscious distortion, random responding and indecisiveness by advising caution if a candidate has responded in an unusual manner. Three scales are built into the assessment to provide the assessor with detailed guidance on how to interpret a candidate's responses. The impression management scale highlights if a candidate's answers are "socially desirable", informing the assessor that the participant may have attempted to create a socially desirable impression. This knowledge can be used during the candidate feedback session to explore the potential reasons why this may have occurred and interpret any results with caution. The other scales include a measure of how often an individual has chosen the "true" or "agree" response (possibly reflecting a high need for approval), and whether or not a participant appears to have responded randomly or indecisively (138).

Cattell's original analysis highlights that different groups of participants demonstrate personality differences. For example, gender differences were present within the data obtained through representative samples, such as males scoring significantly higher for "social boldness" and "dominance". There were also significant differences in predominant personality traits between the U.S. and U.K. populations (133). These differences included significantly higher scores in British females for "*vigilance*" and "*privateness*" than their American counterparts; with British males demonstrating higher scores for "*reasoning*" and "*openness to change"*.

Cattell also explores the impact of personality traits upon group dynamic phenomena and behaviour in group situations within his 1970 handbook (133). It was noted that certain traits manifested in certain ways in a group environment. These include:

- Individuals with high scores for "*warmth*" made more "socio-emotional positive remarks"
- Those with high scores for "*rule-consciousness*" are recorded as showing "high total participation in group life and offering dutiful, group-task-orientated discussion"

- Those with high scores for "*tension*" show "general dissatisfaction with group rules, conduct and unity and do not feel accepted". (133)

The stability of personality traits over time has been the subject of fierce debate. Personality is often thought to be generally organised and stable. It originates within an individual and tends to remain fairly consistent throughout life. It has been postulated that personality traits change with development, but reach stability between the ages of 20 and 30, by which point they are essentially fixed (139).

A meta-analysis of 152 longitudinal studies found that high levels of consistency were demonstrated across a life's course (140). However, this meta-analysis also concluded that whilst this trait consistency was high, they also found that traits retained a dynamic quality. The presence of this dynamic element to personality traits is consistent with views that there is meaningful change in personality during adulthood (141, 142).

A 2014 study in Germany and Australia examined personality types across adulthood and old age using data from 2 nationally representative panel studies, at two different periods of time. The study concluded that personality were highly consistent across age, time and gender (143).

Whilst this debate regarding the consistency of personality continues within the academic literature, it is evident that even in arguments where there is a dynamic quality to personality traits, they appear to develop and become more refined, rather than individuals undergoing complete personality changes and subsequently exhibiting different behaviours. As such, the use of personality data in adulthood can be a useful marker of suitability for professional roles, and possibly an individual's propensity for anxiety / burnout or poor performance (144, 145).

1.1.6.3. The Use of Personality Assessments in Healthcare Professionals

Personality testing is included within the umbrella of psychometric testing - testing standards which are designed to measure latent constructs which cannot be observed, such as intelligence or introversion (146). Personality assessments are often used by employers in the private sector during recruitment in order to match candidate characteristics to job requirements (147, 148).

The use of psychometric assessments in healthcare recruitment is rare, but personality testing has been used within a research context to understand more about those working in the healthcare setting.

The 16PF assessment has been used in healthcare professionals (notably nursing staff and medical student populations) to investigate the impact of personality on measurable outcomes. A cross-sectional survey of 159 nurses in 2012 (149) found that being clinically excellent significantly correlated with high scores for "*social boldness*", "*openness to change*" and "*perfectionism*", and lower scores for "*dominance*" and "*vigilance*". The authors subsequently argue in favour of recruitment to such roles based upon the results of personality assessments. A survey exploring opinions on personality in anaesthetists in Scotland and New Zealand (150) found the majority did not believe personality traits influenced their response to challenging situations, but if presented with the personality traits of potential new recruits that this would influence their hiring decisions. A study compared 16PF scores of critical care nurses with those on general wards, finding differences in communication and social skills (151).

Several studies of medical students have found an association between the presence of dominant personality traits and performance (both academic ability and non-cognitive skills such as empathy) (152-155). It was also demonstrated that individual personality characteristics are associated with different clinical skills (152), and that the relationship between personality and performance becomes increasingly significant with advancement through medical training (153). A study of anaesthetists, using a modified version of the 16PF assessment found significant differences in the personality types of male and female anaesthetists, with females self-reporting themselves as being "calm", "patient" and "tolerant" significantly more often than their male colleagues (156).

1.1.6.4. Unanswered Research Questions on the Personality in the Healthcare Environment

Much of the existing research into the manifestation of personality traits and subsequent behaviour in the workplace is quantitative in nature, providing metrics on the predominance of certain traits and correlating them to identified outcomes. There is scope to explore the perceived impact and influence of predominant personality traits with qualitative

methodology, both with respect to an individual's views on how their personality is significant, and on how this is observed by others.

An individual's personality has been implicated in affecting the presence of a psychologically safe environment. Psychological safety can be positively impacted when the personalities of team members align – (for example, if individuals within the team are all inclined to be proactive, this will promote speaking up behaviours) (157). An individual's personality traits can affect their perception of psychological safety - a study of 475 teachers investigated correlations between self-reported psychological safety and traits on the 16PF, finding a significant correlation between high levels of psychological safety and particular traits (158). Edmondson postulates that personality influences psychological safety at the individual level – but that its impact may be more important early in a team's life – once team members know each other better the impact of personality may lessen (34). Another review on psychological safety argues that a climate of psychological safety would amplify the positive effects of an individual's predisposition to act proactively (38).

There is scope to investigate this interplay between psychological safety and an individual's personality traits further, with a view to expanding our understanding of the conditions that promote psychological safety.

The potential benefit of using personality assessments in healthcare recruitment has been suggested. Personality has been linked to an individual's values and it has been modelled that together these influence goal striving and goal accomplishment (159), both qualities required in healthcare workers.

A thematic review collated evidence on the use of personality assessment tools for shortlisting candidates in the healthcare setting (160). It highlights that many do not advocate for the use of self-report tools in recruitment, even though many tests are designed to identify when an individual is 'faking' their answers. The review concludes that personality assessments may be useful as a complimentary tool in selection, guiding values-based questions at interview (160). To confidently use personality traits in recruitment, even as an aid, an improved understanding of what makes an individual suitable for specific roles within the healthcare environment is required.

In addition to recruitment, personality assessments can be used within existing teams to improve understanding and team cohesiveness. Again, there is limited data regarding the real-life application of this – highlighting another opportunity for ongoing research. A cross-sectional study in healthcare students correlated interpersonal collaboration with personality traits. Findings included a positive correlation between their perception of cooperation with other team members and certain traits including agreeableness, conscientiousness and openness (this study used the Big Five assessment) (161). A 2020 article postulates that personality assessment can be used to improve nurses' understanding of themselves and how they behave, leading to effective clinical practice and better communication (162). A 2012 study recruited 16 healthcare professionals within surgical theatre teams to undergo a personality assessment (163). The study subsequently assessed cohesiveness of the teams' participants worked in clinically, relating this back to personality traits. Through the identification of personality traits, teams were subsequently manipulated to improve cohesiveness scores. The authors call for more research into the success of such actions in improving teamwork.

The predominant participant group in many studies on personality in the healthcare setting are medical students (152-154, 164). It would be beneficial to expand these assessments across clinical specialties and the multidisciplinary teams, to build a picture of which traits predominate in which environments, and the potential consequences of this for teamwork and outcomes.

1.2.AIMS OF THESIS AND RESEARCH QUESTIONS

A major aim of the work presented in this Thesis was to investigate the presence of psychological safety and stress in healthcare workers, exploring the factors that affected the presence of these phenomena. It was hypothesised that an environment of psychological safety would be beneficial for those working within it, and that stress would have negative consequences for these individuals. It was also hypothesised that psychological safety would promote organisational safety, with stress and its sequelae being detrimental.

There are many components that contribute to the manifestation of these phenomena within healthcare including the workplace environment, team dynamics and an individual's personality. Through a comprehensive evidence synthesis and a series of mixed methods

studies these factors were investigated to understand further their influence on psychological safety and the presence of stress. In addition, the potential sequelae of these phenomena were explored, including the presence of resilience and the perception of whether a safe service for patients was being delivered.

The Thesis aims not only to understand and quantify the presence of psychological safety and stress, but to identify modifiable areas within the healthcare environment that can be improved to support staff and create a better working environment. The analyses within this Thesis aim to provide team leaders with frameworks and tools that can be utilised within their own workplace environment to enhance the presence of psychological safety, improve working relationships and reduce the incidence and negative impact of stress. It is postulated that this will assist in reducing medical error, promote staff wellbeing and improve intention to stay within the workforce.

Four research questions were designed:

1. What is the presence and consequence of psychological safety within the healthcare workforce?

2. What factors influence a psychologically safe environment within the workforce, with particular focus upon the influence of personality.

3. What factors contribute to the presence of stress within the workforce, with particular focus upon the influence of the workplace environment.

4. How do psychological safety and stress impact an individual's wellbeing and organisational safety?

A series of studies were designed to investigate the phenomena of interest within the research questions. These initially focused upon the critical care environment, subsequently expanding to include and explore other areas within the healthcare setting. This expansion aimed to corroborate initial analyses, observe for differences in aetiology and outcome and help enhance the potential generalisability of the findings.

1.3.STRUCTURE OF THESIS

This thesis is organised as follows. There are four main study chapters, each reflecting a distinct but related research project relating to the presence and manifestation of psychological safety and stress in healthcare workers. The methodology for all four studies is outlined in Chapter 2, with additional detail housed within each study chapter where relevant. Chapter 3 concerns a large evidence synthesis investigating the presence of psychological safety in healthcare workers worldwide. This encompasses an extensive literature review, accompanied by a subsequent thematic analysis that generates analytic themes beyond the content of the original studies. Chapter 4 presents the results of a study exploring psychological safety and safety attitudes in critical care staff. The resulting analysis is built upon in Chapter 5, where a study compares psychological safety and stress in critical care and emergency department staff. This Chapter incorporates an assessment of participant personality, exploring the influence of this on psychological safety, stress and how suitable an individual may be for their professional role. Chapter 6 concerns a study exploring stress and psychological safety in hospital managers, exploring the manifestation of psychological safety and stress in a very different and under-represented participant group. It also explores outcomes related to stress such as the presence and development of resilience.

An overall analysis and summary of the research outcomes is provided in Chapter 7. This chapter concludes the Thesis, stating the achievements of the research, novel findings and discussing limitations. The potential impact of the research is framed within the wider context of understanding and improving the environment healthcare workers operate in and identifying potential areas for future research.

2. CHAPTER 2: METHODOLOGY

2.1. MIXED METHODS APPROACH

The overarching aim of this PhD programme is to provide an in-depth evaluation of the presence of psychological safety and stress in healthcare workers. It aims to evaluate the factors that may contribute to these climates with a particular focus on the critical care environment. This research also aims to explore the impact of phenomena such as psychological safety and stress, both on individual wellbeing and the safety of the organisation they work in.

To answer the research questions, a mixed methods approach was chosen – integrating both qualitative and quantitative data collection tools and analysis strategies within each research study, rather than using two singular research methods to independently address the same research objective.

A mixed methods approach requires the incorporation of two research paradigms – positivism and interpretivism.

Positivism is an approach based upon the objective interpretation of data, and that the findings are observable and quantifiable (165). In this regard, the researcher is "independent" from the research, allowing it to be purely objective. This approach is reflected in the use of quantitative methods.

Qualitative research methods are based upon *interpretivism* and facilitate a naturalistic method of inquiry – exploring human systems to generate data and construct emergent theories and ideas (166). This approach generates context-specific ideas (167) that are not intended to be generalisable across populations, unlike results generated during a more quantitative approach. Somewhat by contrast to *positivism*, *interpretivism* reflects an interest in the understanding of the meaning of phenomena obtained from a participant's subjective views.

It has been argued that true mixed methodology is impossible as a consequence of these underlying opposing paradigms (168). However, rationales for combining data have been developed. Three categories of approach have been developed (169, 170):

1. A paradigmatic stance – ignoring any issues regarding paradigms.
2. A multiple paradigm approach – stating that the two paradigms are not incompatible and can be used within one research project.
3. A single paradigm approach – claiming that both research methods can be accommodated under one paradigm.

I elected to use a multiple paradigm approach, keeping the paradigms of the two methods separate in order to draw on the strengths of each one – known as a complementary strengths thesis (171).

The rationale for using mixed methodology in this PhD programme stems from the belief that the use of qualitative and quantitative approaches in conjunction, with later integration of the findings to generate conclusions, provides a benefit in addressing the research questions that either method would not be able to achieve in isolation. It is also proposed that mixed methods research can promote the strengths and minimise the weaknesses of both research methodologies, particularly when used to explore complex research questions (172).
The use of quantitative methodology provides the ability to demonstrate that the climate being explored (for example a safety culture or an environment of psychological safety) is present in an objective manner, and the level to which this is the case. This adds a level of robustness to the concurrent qualitative analyses – as perspectives and conclusions generated through qualitative techniques are supported by the presence of a demonstrated phenomenon.
By employing qualitative methods alongside quantitative assessment, the subsequent merging and analysis of these two data sets can provide a deeper understanding of complex phenomena and help validate the research findings.

Mixed methodology has been used extensively within healthcare research, highlighting its feasibility as an approach to answering the research questions in this PhD programme. Historically, healthcare research has been dominated by quantitative approaches, although over the last three decades there has been a notable rise in the number of published qualitative studies, with the proposal that “problem-orientated research would benefit from the introduction of theoretical perspectives” (173).

There are four elements to be addressed in the design of mixed methods studies (174):

1. How much the qualitative and quantitative data will be kept independent of each other.
2. The implementation sequence of data collection. This can be in parallel, sequential or nested - with one research methodology being predominant and the second embedded within the study.
3. The level of priority given to qualitative / quantitative data.
4. The point at which the two data sets are integrated – involving integration, connection and embedding of the two components (175).

Thus, there are four recognised approaches for the design of mixed methods studies (170).

1. **Triangulation.** The aim in this approach is to obtain different but complementary data on the same topic, with mutual corroboration of results.

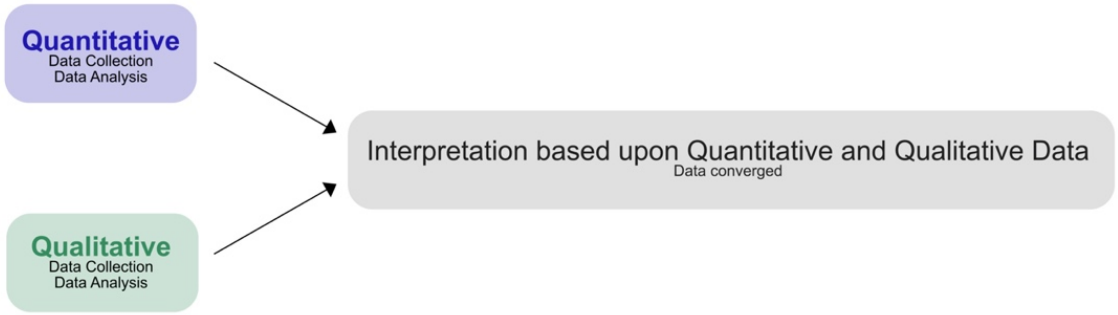


Figure 2. Schematic Diagram Illustrating how Data are combined through Triangulation

2. **Embedded.** The study is based primarily upon one research methodology, with the second data set enhancing the results.

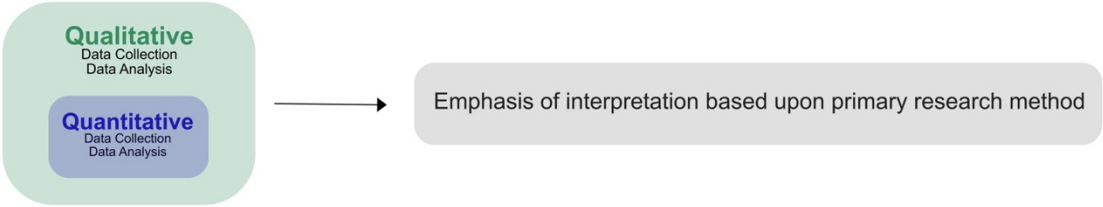


Figure 3. Schematic Diagram Illustrating an Embedded Approach

3. **Explanatory.** This is a two-phase design, where quantitative research is conducted first, with qualitative data used to explain or build upon results.

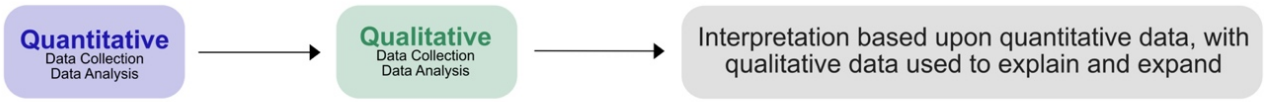


Figure 4. Schematic Diagram Illustrating the Sequence of Steps in an Explanatory Approach

4. **Exploratory.** This is another two-phase design, with qualitative research implemented first to build a foundation of understanding, later using quantitative results to generalise and test.



Figure 5. Schematic Diagram Illustrating the Sequence of Steps in an Exploratory Approach

Figures adapted from Creswell and Plano's discussion of mixed methods designs (2007)(170).

These research elements and approaches were considered during the development of each mixed methods study within this PhD programme, particularly with regard to their potential influence on the analysis and conclusions drawn. In general, priority has been given to qualitative data throughout, including quantitative elements through triangulation or an embedded approach. These approaches were chosen as it was felt that qualitative research would better answer the research questions, providing evidence of NHS worker's lived experiences and exploring the reasons for these perceptions. Whilst useful in terms of gauging the presence of phenomena such as psychological safety, quantitative data alone would not provide answers as to what influences such an environment or how it impacts staff members. Where other approaches to study design are used this is explained within the thesis in the relevant methods section, with the appropriate rationale for doing so.

2.1.1. QUALITATIVE METHODS

To become proficient in the qualitative methods required to design and implement my research I attended a Qualitative Research Methods Course at King's College London prior to the commencement of this PhD programme in July 2018.

2.1.1.1. Qualitative Interviews

Semi-structured interviews were used to gather qualitative data. This approach allowed participants' experiences to be explored in depth generating description and facilitating interpretation of the world they inhabit (176).

At the outset of this PhD programme, it was intended that all qualitative interviews would take place in person, in private rooms within the workplace of each participant. However, following the onset of the COVID-19 pandemic in March 2020, and subsequent social distancing restrictions, the remaining interviews were conducted virtually via the Microsoft Teams Platform. There were advantages and disadvantages to using a virtual platform. Positively, it aided logistics, as participants appeared to find it easier to find a short window of time to schedule an interview. From a researcher's perspective, it minimised time spent travelling to interviews, and limited wasted time if interviews required rescheduling last minute. Locations for the interviews were selected by the participants. This led to some considerations during data analysis – participants were now often at home rather than in their workplace, on occasion giving the impression that they were more comfortable discussing difficult scenarios within this setting. Disadvantages of a virtual approach included limited appreciation of body language and no opportunity for true eye contact, making building a rapport with participants more difficult. It also introduced a risk of technological failure, and increased challenges when recording interviews if the internet signal was poor.

However, even with all these factors considered, moving to a virtual platform for qualitative interviews was successful. There were no significant issues generating audio transcripts from recordings of virtual interviews. The length of the interviews meant that it was still possible to establish a rapport, and comparing the quality of the data sets between those conducted in person and those virtually there is no discernable difference.

For all interviews, participants received information sheets at the point of recruitment, and informed consent took place prior to commencement of the interview.

The audio of interviews were recorded using a small handheld audio recorder, and uploaded via an encrypted secure server to an online transcription company – Way with Words (177). A contract was drawn up between Imperial College and Way with Words, allowing transfer of data and transcription of the audio recordings. The Way with Words server is fully encrypted, data are handled confidentially, and the company is GDPR compliant. All participants were aware that this transfer of data would take place prior to their involvement in the study. Audio files were transcribed with any personal identifiers removed from the transcripts (for example, in the event participants used a colleague's name or their place of work). These written transcripts were subsequently uploaded and stored in a folder with limited permissions within a secure NHS server. Once stored, they were uploaded into qualitative analysis software NVivo (R1 (Mac)) for analysis. I was trained in the use of NVivo software through an online course. This software facilitates the organisation of qualitative data into codes and themes, allowing straightforward re-review and the generation of higher order themes.

2.1.1.1.1. Topic Guide for Qualitative Interviews

The design of each topic guide was led by the research questions for the Thesis and individual study aims, and informed by literature reviews and preliminary work where relevant. These initial topic guides were approved during each study's approval process.

Qualitative interviews were designed to be semi-structured, in which open-ended questions were developed to capture data regarding the phenomena of interest. This allowed individual participant stories to be explored, potentially pursuing in depth new areas that emerged (178-180). The analysis of qualitative data is acknowledged as being an "*ongoing and inherent part of the whole process of qualitative research*" (176). As the method for qualitative data generation was interactive (in the form of interviews), reflection and refinement of the ongoing data collection was expected in order to direct the later, formal analysis (176).
In addition to the content of interviews being adapted in real time according to relevant participant experience, concurrent review of the data allowed for modifications to future data collection. Interview data were analysed in parallel alongside ongoing recruitment as an iterative process. Field notes taken during and immediately after each interview were reviewed, and subsequently the transcripts themselves. This allowed the identification of

frequently occurring ideas, themes and concepts that developed beyond the areas identified within the initial topic guide. Modification of the topic guide for subsequent interviews took place based on participant's responses and developing themes (181). This incorporated any points learnt into the remainder of the research, with the aim of generating a more rich and useful qualitative data set.

2.1.1.2. Methods of Qualitative Data Analysis

A thematic analysis technique was predominantly used throughout the research studies in this Thesis. Where other qualitative techniques are used, these are explained within the corresponding study methods section.

2.1.1.2.1. Thematic Analysis

A thematic analysis approach was selected as this involves discovering, interpreting and reporting patterns of meaning within the data (176). This approach also allowed data to be reviewed in the context of different research questions, as this technique facilitated the sorting of large amounts of data into broad themes.

The approach to performing a thematic analysis was in line with published guidance on the conduct of thematic analyses (182). The analysis followed an *inductive* approach, with any resulting themes or ideas being strongly linked to the data, rather than answering pre-conceived ideas or fitting into a pre-existing framework. The process of thematic analysis was recursive, with constant re-review of all the interview transcripts at each stage of the analysis.

Thus, the stages of the thematic analysis were as follows:

1. **Familiarisation with the data set**. This required a thorough review of each transcript within the study, making notes regarding apparent themes and ideas that either answered the research objectives or were novel concepts arising from the data.
2. **Coding.** Following familiarisation with the data, transcripts were re-reviewed, leading to the generation of initial codes and searching for themes. Utilising NVIVO software, relevant segments of qualitative data within each transcript were labelled as corresponding to specific codes.

3. **Construction of an initial thematic framework**. As the data were coded and themes identified, the process of defining and naming these themes led to the construction of a thematic framework that encompassed each research objective, as well as novel themes and concepts that were present.
4. **Indexing and sorting of data**. Following construction of the thematic framework, qualitative data were organised according to the codes and themes within the framework.
5. **Review of data extracts.** Data were then re-reviewed, with the intention of creating higher order analytical themes.
6. **Data summary and display.** Depending upon the results of each analysis, data were organised into tables and graphics that conveyed the identified themes and novel concepts where applicable.

In order to corroborate identified themes and ensure they were in accordance with the data and research objectives, discussion with academic supervisors took place at each step in the thematic analysis.

In addition, to ensure the coding process and resultant themes originated from the data, provide consistency and minimise coder bias, 10% of the qualitative data within each study were coded by a second researcher (176, 183). Once this was complete, a measure of inter-rater reliability was calculated using NVivo software. This took the form of two measurements. Firstly, the percentage agreement between the two coders was calculated. Secondly, a statistical measure to determine the observed agreement was determined – the Kappa Coefficient (184). This reflects how likely agreement is due to chance and yields a value between 0 and 1. Values > 0.7 demonstrate excellent agreement, fair to good agreement is reflected in a value between 0.4 and 0.7, and poor agreement <0.4 (185). It is possible for the Kappa coefficient to be negative – which suggests that there is no effective agreement or that the agreement is worse than random.

The kappa coefficient is calculated within NVivo software according to the following formula:

$$K = Pr(a) – Pr(e)\ 1 – Pr(e)$$

Where Pr(a) represents the actual observed agreement, and Pr(e) represents agreement occurring due to chance. Again, any evidence of discrepancies between coders following the calculation of inter-rater reliability was resolved through discussion between coders and academic supervisors.

2.1.1.2.2. Reflexivity

Reflexivity is a way of ensuring rigor and quality is maintained throughout the conduct of each qualitative study by acknowledging the contextual intersecting relationships (such as cultural background, prior experience, gender and professional beliefs) between study participants and the researcher (186). For each study I was aware that my role as a researcher who had worked in the clinical environment would have an influence upon the practice of the research and that this could influence the object of the research. Having a position of "shared experience" can be beneficial as it equips the researcher with insights into the research topic and provides the ability to understand implied content. However, a deliberate effort is required during collection and analysis to ensure the participant's "story" is the one being told, and not the researchers (187).

Reflexivity was also important during the final study in this PhD, in which the study participant group were hospital managers, an area in which I did not have expertise. This can be an advantageous situation as it places the participant in the position of "expert", however loss of nuance and understanding of subtleties within the environment can potentially limit the scope and depth of data collection. I was aware of the requirement to consistently revise my pre-existing understanding of the research topics in light of new understandings that were gained through the process of data collection and analysis (188). Discussion regarding research themes and new concepts that emerged from the data was conducted with this in mind with academic supervisors, and a reflexive journal was kept throughout all qualitative research studies, facilitating critical evaluation throughout. This ensured the analysis was a trustworthy representation of the themes within the data, and minimised the incorporation of researcher bias into the analysis and resulting conclusions.

2.1.2. QUANTITATIVE METHODS

Three phenomena were studied using quantitative methods within the programme – staff attitudes to safety, the presence of psychological safety, and individual resilience. Where possible, previously validated surveys were used in the assessment of each phenomenon. In addition, an assessment of stressful clinical factors was made, however this did not use a validated survey – instead this assessment was created by creating a list of commonly stressful factors identified in a thorough literature review.

For each quantitative survey, answers were provided in the form of Likert items, and combined into Likert scales as appropriate. These were either three- or five-point scales and were analysed using descriptive statistics. There is ongoing debate about the most appropriate way to analyse data obtained from Likert Scales (189). In this PhD programme Likert items were treated as categorical ordinal data given the accepted notion that it is very difficult to quantify the exact "distance" between two points on each Likert item (such as "disagree" and "strongly disagree"). Consequently for each Likert item, the median, mode and interquartile range were calculated to provide a measure of participant opinion for each question and displayed in a grouped bar chart.

Likert items that all correspond to the same topic can be combined to create a Likert Scale. There is a comprehensive argument that these composite data in the form of Likert Scales can be viewed as continuous interval data. As such for these data average means and standard deviation values were calculated (189-192).

Summed standard deviations were calculated using the following equations:

Average S.D = $\sqrt{(s_1^2+s_2^2+.....+s_k^2)}/k$

Where:

s_x= Standard deviation for k^{th} responses

k = total number of responses

For some items it was possible to answer N/A, for which values were counted as missing data. For these items the total number of responses would vary between items. Where the total number of responses were uneven between the Likert items the following equation was used:

Average S.D. = $\sqrt{((n_1-1)s_1^2 + (n_2-1)s_2^2 + \ldots(n_k-1)s_k^2) / (n_1+n_2\ldots+ n_k-k)}$

Where:

n_k: Sample size for k^{th} responses

s_k = standard deviation for k^{th} responses

k = total number of responses

For the second research study in this PhD programme a "quantitative" assessment of personality was used to facilitate the investigation of the influence of personality on other factors evaluated. This assessment was incorporated to provide an objective and reproducible measurement of the personality traits of participants and allow for comparisons to be made between participant sub-groups.

The personality evaluation used is the 16 Primary Factor (16PF) assessment (Chapter 1.1.5.2). The rationale for utilising this tool was based upon it being a well recognised and validated personality assessment, and one often used in the study of personality in healthcare workers (193, 194).

The license to use and administer the 16PF assessment is held by PSI (Services LLC). PSI is a company offering psychometric assessments and "talent management solutions" (essentially aiding companies in recruiting "suitable" individuals for professional roles, as well as providing career coaching for individuals. This is achieved through pre-employment testing.) (195). In order to use the 16PF assessment, I first had to undergo training in the administration of the assessment and the provision of structured feedback to participants. Once complete, I was able to administer the assessment to participants via an online platform hosted by PSI. Participants were provided with an electronic link to their assessment, and once completed I was provided with a report detailing their scores for each primary factor assessed. Raw scores are processed by PSI and converted to Standard Ten (STEN) scores, facilitating a more precise comparison of scores across individuals in a sample.

Each candidate answers 185 multiple choice items questions within the 16PF assessment, generating a raw score for each primary factor assessed. The use of STEN scores is a common method of presenting the results of psychometric testing, and there are a number of ways in which these scores can be calculated. STEN scores are based upon a normal distribution, with 95% of participants falling between 2 standard deviations of the mean.

A test administrator can convert a participant's raw score to STEN scores using norm tables. These tables are available for the 16PF assessment and are based upon the general population standardisation of the 16PF questionnaire. These were developed by apportioning percentages according to the distribution (for example, if 2% of the population has a score of 0-3 these will be converted to a STEN score of 1). This is a non-linear transformation of the data (196). This conversion of raw scores to STEN is performed by PSI prior to the release of each participant's results.

As these STEN scores obeyed a normal distribution, they were analysed within SPSS software to assess for differences in the groups using an independent t test. This methodology is consistent with other comparisons of 16PF results between groups (197-199).

2.1.3. MERGING QUALITATIVE AND QUANTITATIVE DATA

As outlined above, there are several ways that mixed methods studies using qualitative and quantitative data can be designed. For example, one data set can be used to inform the collection and analysis of a second, or one type of data may take priority in the analysis over another.

Reported within this Thesis are a series of 3 mixed methods studies, with several resulting analysis streams, all aiming to produce evidence that address the overall Thesis research questions. In all cases, the two data sets were initially analysed independently using appropriate techniques, with each providing an understanding of the phenomena under investigation. Subsequently, these analyses and inferences were combined and integrated to produce higher level conclusions (168, 200).

2.2.STUDY DESIGN

The main participant group in which psychological safety and stress were studied were critical care workers (encompassing all members of the multidisciplinary team). As the PhD programme progressed, other groups within the NHS workforce were also studied. Emergency department staff were included as a comparison participant group to critical care staff, to assess whether the manifestation of these phenomena were different across different specialty groups and different clinical departments. Finally, a research study was

designed which investigated these topics in NHS managers, a significant part of the NHS workforce with a huge amount of responsibility, but a group which is underrepresented within the academic literature.

2.2.1. PROJECT STREAMS

To address the research questions, a series of behavioural science studies were designed, informed by preliminary work (Figure 6). These project streams were interdependent. Each individual research study had its own research objectives and questions, all designed to provide detail and concepts which would provide increased detail and ultimately answer the broad research questions of this PhD programme.

As each project was initiated and developed in sequence, novel research themes that emerged during the analysis of earlier studies informed the ongoing direction and analysis of the later studies. Two preliminary studies, conducted in the months prior to start of this PhD programme also informed the design of the research.

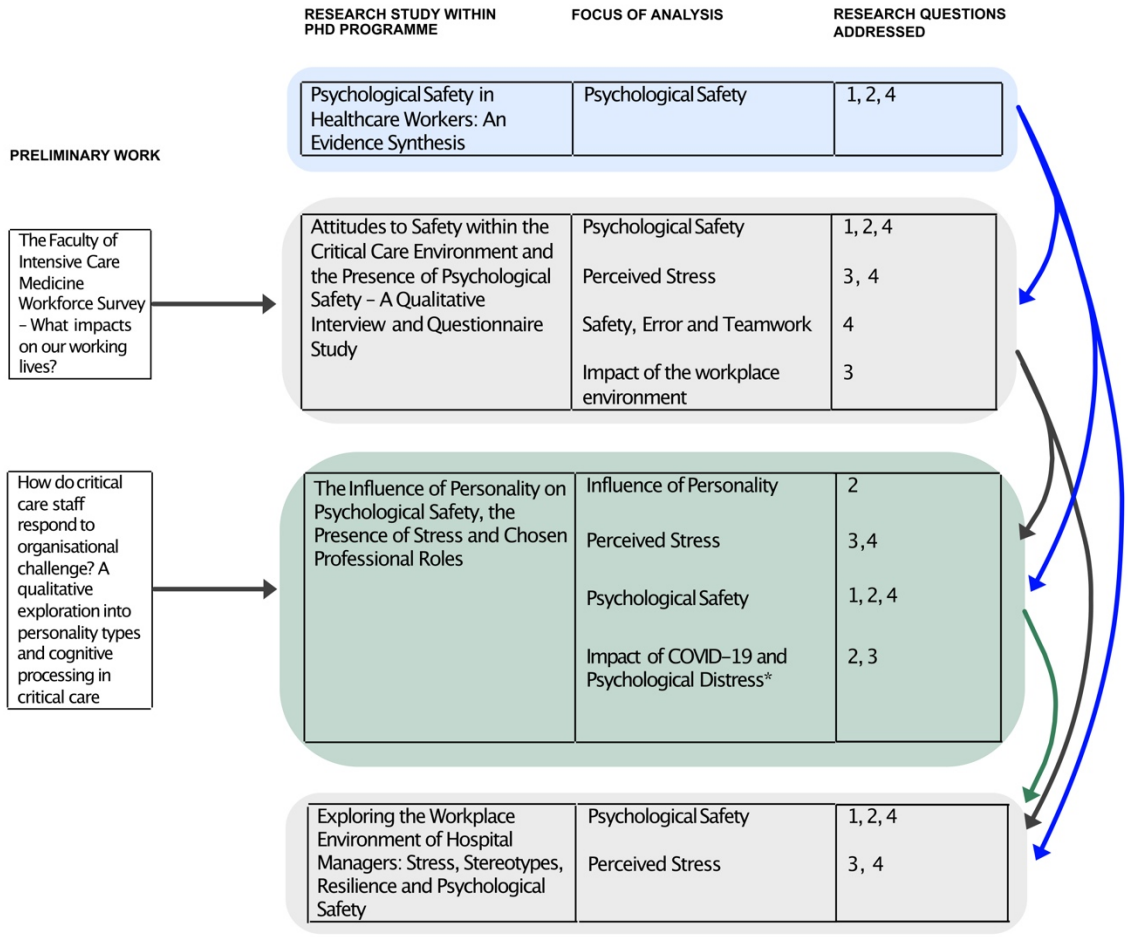


*Figure 6. Outline of Project Streams within this PhD programme. Arrows indicate where one piece of work informed ongoing study design and ongoing analysis. *Data analysis originated as a consequence of the COVID-19 pandemic, not part of original research plan*

2.2.2. RECRUITMENT

For all studies, participant groups were recruited from three sites at Imperial College London NHS Healthcare Trust in London, United Kingdom. The three sites within this trust that were included were Charing Cross Hospital, St Mary's Hospital and Hammersmith Hospital. These are three large teaching hospitals, with similar organisational structures and hospital protocols. Whilst different clinical specialties are cared for at the different sites, staff often work cross site and are familiar with processes at different sites.

Recruitment from the three sites provided an adequate sample size for the studies, and participants were regarded as one study population.

2.2.2.1. Purposive Sampling Technique

For each study, a purposive sampling technique was applied to the recruitment strategy. Participants from the professional group to be studied were identified and invited to participate via email, social medial channels and physical advertisements.

Purposive sampling allows the study population to be recruited in order to provide a data set likely to be information rich with regards to the research questions (176, 201) . Participants are selected based upon their likely knowledge of the subject matter to be studied – in this PhD programme this was based upon their knowledge and understanding of the working environment. It also ensures that the study population is reflective of the environment to be studied – again in this context of this PhD programme this meant the study population must represent the workforce, encompassing all levels of seniority and professional discipline. This allows the qualitative analysis to provide a *depth* of understanding (unlike in quantitative studies where a *breadth* of understanding is the aim).

To achieve purposive sampling an understanding of the study population (and for these studies) the workplace environment is required. I was able to do this by drawing on my own experiences working in hospitals as a junior doctor, utilising the experience of my supervisor (a critical care Professor) and through discussion with department and hospital leads. The process of purposive sampling and recruitment ceases when the researcher is confident thematic saturation has been achieved within the collected data.

2.2.2.2. Thematic Saturation

In line with a qualitative thematic analysis approach, thematic saturation can be defined as the point at which no new codes or themes are added to the thematic framework (202-204). An assessment of thematic saturation was based upon the iterative review of ongoing interviews, as a consequence of their emerging content (204). Whilst it is difficult to say for certain that nothing “new” will emerge with further interviews, researchers often describe the point of thematic saturation as being the point at which it is perceived that nothing new will add to the overall story or theory (205, 206).

2.2.3. STUDY APPROVALS

In line with U.K. Research Governance guidance, studies that involve NHS staff by virtue of their role do not require NHS research ethical approval. For the three mixed methods studies involving the NHS workforce, Health Research Authority approval was sought and granted, in addition to approval from Imperial College's Research Governance and Integrity Team (RGIT) (formally Imperial College Joint Research Compliance Office). Studies were also approved by Imperial College Healthcare NHS Trust.

The evidence synthesis was registered on the Prospero database (record CRD42019120104).

2.2.4. DATA HANDLING AND STORAGE

All qualitative and quantitative data were held on a secure NHS server in a folder with limited access, and all stored under a unique study number allocated to each participant. All data were therefore "linked-anonymised" and were handled in accordance with GDPR. There was no transfer of data out of Imperial College or Imperial College NHS Trust.

Qualitative Interview Data:

Interviews were audio recorded and transcribed by Way with Words, a U.K. transcription company who held a data sharing agreement with Imperial College London. All files and transcripts were stored under a study number (allocated at random). No files were stored under personal identifiers and any information which might identify the interviewee or individuals discussed during the interviews were removed by the transcription company. Once written transcripts were received and checked audio files were deleted.

Survey Data:

There were two approaches to the use of quantitative surveys within my mixed methods studies. Surveys were either housed within the qualitative interview topic guide (and therefore administered verbally), or were provided as written forms for the participant to complete. Quantitative data obtained through the qualitative interviews were located within the interview transcripts and stored as above. Quantitative survey data were stored without any personal identifiers, only under the participants allocated study number.

Personality Data (16PF):

16PF assessment scores were downloaded from the PSI server in the form of a detailed report and the STEN scores themselves. These detailed reports had participants names on them and were given to participants. These reports were not stored by the study team outside of the secure PSI server. Quantitative data in the form of STEN score were extracted from these reports and stored securely under the participants study number.

Consent forms:

Paper consent forms were used for the first mixed methods study, and the second until the onset of the COVID-19 pandemic. These were converted to electronic files and the originals destroyed. Following the onset of the COVID-19 pandemic all consent forms were electronic.

3. CHAPTER 3: PSYCHOLOGICAL SAFETY IN HEALTHCARE WORKERS: AN EVIDENCE SYNTHESIS

To obtain a thorough understanding of the current evidence for psychological safety within healthcare workers around the world a large review and evidence synthesis of the existing published literature was undertaken. In addition, it was anticipated that the findings of this synthesis would provide support and inspiration for the subsequent sequential studies within this PhD, helping narrow their focus and to address gaps within the current literature.

This project had two intentions. First, to collate the current evidence regarding psychological safety leading to an increased understanding. Secondly, to undertake a thematic analysis of the complete synthesised data set, generating novel analytical themes regarding the presence of psychological safety beyond the conclusions of the original papers.[5]

3.1. RATIONALE FOR EVIDENCE SYNTHESIS

Healthcare workers are required to be effective and deliver safe care for patients in challenging and fast paced environments. It is essential that they can perform accurate decision making, minimise error and generate innovative solutions when required (207, 208). There has been no previous assimilation of qualitative literature regarding psychological safety with the specific aim of establishing and evaluating the presence of psychological safety in healthcare workers.

Previous explorations into psychological safety in healthcare have focused upon the outcomes for patient safety or the healthcare organisation itself. The intention of this evidence synthesis was to keep staff experiences at the centre of the analysis.

Ongoing investigation into the methodology used to evaluate psychological safety has been suggested as an ongoing area for research (38). A stated aim of this evidence synthesis was

[5] This study was published in BMC Health Services Research. Permission has been obtained from the journal and co-authors to use the published data in this thesis. The article is licensed under a Creative Commons Attribution 4.0 International License and is open access.
Grailey KE, Murray E, Reader T, Brett SJ. **The presence and potential impact of psychological safety in the healthcare setting: an evidence synthesis**. BMC Health Services Research. 2021;21(1):773.
Contributor Statement: KG and SJB were involved in conceptualisation of the study. KG was responsible for protocol development, data extraction and data analysis. Analytical themes were discussed between KG, EM, TR and SJB. KG was responsible for writing the manuscript, with review by EM, TR and SJB.

to collate the methodologies with which psychological safety has been evaluated in healthcare workers, as there is no standardised or validated method for this at present, despite there being several widely used tools for the assessment of psychological safety (26, 209).

3.2. RESEARCH OBJECTIVES

There were three key objectives within this evidence synthesis:

Objective 1. Synthesis existing literature investigating psychological safety in healthcare workers and use qualitative research methods to explore the presence of psychological safety in this workforce.

Objective 2. Identify the methods used to assess psychological safety in healthcare workers.

Objective 3. Review the literature for evidence of consequences of high or low psychological safety.

These research objectives were designed to address elements of the first two research questions within this thesis:

1. What is the presence and consequence of psychological safety within the healthcare workforce?
2. What factors influence a psychologically safe environment within the workforce, with particular focus upon the influence of personality.
3. What factors contribute to the presence of stress within the workforce, with particular focus upon the influence of the workplace environment.
4. How do psychological safety and stress impact individual wellbeing and organisational safety?

3.3. METHODS

3.3.1. PROTOCOL DEVELOPMENT

The study protocol was developed using the Cochrane Effective Practice and Organisation of Care Group (EPOC) template (210) and registered on the Prospero Database (https://www.crd.york.ac.uk/prospero/ Registration Number: CRD42019120104). This database has been updated as the study progressed and completed.

The protocol was informed through a background literature review on psychological safety and its importance in healthcare workers (1.1.2) and was designed to address gaps in the current body of evidence on this topic.

This evidence synthesis used PRISMA as its principle guideline (211). In addition, the Cochrane Qualitative and Implementation Methods Groups Guidance Series (212-215) were used during protocol development as it was anticipated that a large proportion of the included studies would be qualitative or mixed methods in nature.

3.3.2. SEARCH STRATEGY

This evidence synthesis was initially designed with the intention of including purely qualitative studies. However, in line with qualitative methodology, whilst a pre-planned comprehensive search strategy was designed, it was anticipated that as the study progressed it would evolve as an iterative process. Following preliminary searches the inclusion criteria were expanded to include *all* studies addressing psychological safety in healthcare workers. This was felt to be the most comprehensive way to address all three research objectives.
Consequently, all studies with the investigation of psychological safety as a specific aim or as a theme that emerged within the study analysis were included for review.

The electronic search strategy and inclusion criteria were developed using the SPIDER tool (216), due to its appropriateness for qualitative research studies. The final plan for conducting the evidence synthesis, organised according to the SPIDER tool was as follows:

Sample: Healthcare workers (including all members of the multidisciplinary team and all levels of seniority)

Phenomenon of Interest: Psychological Safety

Design: All primary studies that used qualitative study designs including ethnography, phenomenology, case studies, grounded theory studies and qualitative process evaluations. Studies that used qualitative methods for data collection (interviews, focus groups, observations and open-ended survey questions) and data analysis (e.g., thematic analysis) were included. Given the prevalence of surveys as a tool used to assess psychological safety, studies which were quantitative in their design were included. Studies were included irrespective of their publication status and language of publication.

Evaluation: An exploration of the presence of psychological safety present in healthcare workers, the methods utilised to assess psychological safety, and the potential consequences of high or low psychological safety.

Research Type: Qualitative, Quantitative and Mixed methods.

Using this as a guide, the following search strategy was developed:

Search Strategy

S: "Healthcare worker*" OR "Physician" OR "Nurs*" OR "Doctor" OR "Medic*"

PI: "Psychological Safety OR Interpersonal Risk" OR "Team*" OR "Communication" OR "speak* up"

D: "questionnaire" OR "Survey" OR "interview" OR "focus group" OR "case stud*" OR "obser*"

E: "experience*" OR "opinion" OR "outcome*" OR "satisfaction"

R: "qualitative" OR "mixed method" OR "quantitative"

It is acknowledged within the literature and published guidelines on the synthesis of qualitative studies that the indexing of qualitative studies may not be as comprehensive or amenable to "searching" compared with predominantly quantitative work. Thus, search terms were deliberately broad. The following electronic databases were searched to identify studies that were eligible for inclusion: Web of Science, PubMed, OVID: Embase. EBSCO: Cinhail, OVID: Global Health, OVID: HMIC, Google Scholar. These were searched from their date of origin through December 2018.

3.3.3. SELECTION OF STUDIES AND DATA EXTRACTION

A large number of studies were identified for title review as a function of the broad search strategy. Many papers were rejected at this stage as despite addressing topics such as teamwork or psychological safety they were not directly related to the topic of interest – psychological safety in healthcare workers.

Following title review, the abstracts of remaining studies were reviewed for evidence that they addressed the topics of psychological safety, safety within healthcare, speaking up or teamwork; all in a healthcare setting.
The full text of papers deemed suitable following abstract review were retrieved and reviewed in detail.

Once accepted for inclusion within the final analysis, studies were re-reviewed. Data identified as addressing the research objectives were extracted and assembled within a Microsoft Excel Table (Table 1).

Table 1. Data Extraction Categories

Category	**Data Collected**
Study Location	Country
Site	Hospital Department Clinical Environment Primary vs Secondary Care
Population of Healthcare Workers	Role Specialty Level of Seniority
Method of Sampling Participants	Method
Outcome Measures	Study Primary Outcome Measures
Research Methodology	Quantitative, Mixed, Qualitative Tools used to assess psychological safety
Measurement of Psychological Safety	Primary Outcome Secondary Outcome Theme that emerged within the results
Level of Psychological Safety Identified (if quantifiable)	If quantifiable: High / Low Supporting Evidence: Quotations & Data Extracts
Evidence of consequences of psychological safety	Evidence of effects on patients Evidence of effects on staff / the organisation Nature of association

In addition to data extraction, the robustness and validity of the methods used in all included studies were assessed using either the CASP Qualitative Checklist tool (217) or published

guidance on the assessment of survey quality (218) as appropriate depending upon the study methodology.

The GRADE-CERQual (Confidence in the Evidence from Reviews of Qualitative Research) (212) approach was implemented to summarise my confidence in each papers findings. CERQual assesses confidence in the evidence based upon four key components: methodological limitations, coherence of the review finding, adequacy of the data contributing to a review finding and relevance of the included studies to the review question. It was anticipated a high proportion of quantitative or mixed methods studies would utilise surveys as a research strategy. The assessment of possible methodological limitations of these surveys was performed in line with published guidance regarding survey quality (218, 219).

3.3.4. SYNTHESIS METHODOLOGY

In order to address the research objectives, this study employed several qualitative techniques, including thematic and content analysis and evidence synthesis. These qualitative techniques have been used in similar qualitative syntheses on quality in healthcare, helping to justify their use in this study (220).

Objective 1: Synthesise existing literature investigating psychological safety in healthcare workers

A thematic analysis of extracted data from included papers was undertaken in a three-step approach. This allowed for the synthesis of data from all included studies to be sorted into coherent and concordant themes and patterns. In addition, this approach allowed for the later development of novel analytical themes.

The technique of thematic analysis is outlined in Chapter 2.1.1.2.2. Detail of how this approach was applied to the evidence synthesis process is outlined below:

1. Review and familiarisation with included papers, followed by extraction of data related to the presence of psychological safety in healthcare workers. Extracted data included key concepts and conclusions as derived by study authors, and verbatim participant data (in the form of published quotes) present in published study manuscripts.

2. Coding of data related to participant's experiences and perceptions of psychological safety. This then led to the development of descriptive themes regarding psychological safety and related variables. Data were coded into two groups – "evidence of high psychological safety" and "evidence of low psychological safety". Once coded, data were re-reviewed to identify commonalities and report patterns.
3. Ongoing re-review of extracted data and coding frameworks, leading to the generation of analytical themes beyond the content of the original studies

Objective 2: Identify the methods used to assess psychological safety in healthcare workers.

Data corresponding to the tools used in each study to assess psychological safety were extracted from the methods section. These were collated according to whether they were quantitative, qualitative or used mixed methodology. Within this, details regarding the exact method of data collection and analysis were extracted and coded.

Objective 3: Identification of any consequences of low or high psychological safety

A content analysis technique was utilised to identify any patterns in conclusions made by each study regarding the observed presence of psychological safety and possible outcomes.

Content analysis is a qualitative research approach that allows the presence of certain themes or concepts to be determined. This is done in a replicable and systematic manner, allowing patterns in the data to be identified (221).

The key stages of this content analysis were as follows:

1. Identification of phrases or themes that highlighted the presence of a consequence of psychological safety, as postulated by the study authors.
2. Pre-defined categories were identified - both positive and negative consequences of psychological safety would be included. No further categories were added as the analysis progressed.
3. Data were coded according to the existence of the concept, rather than the frequency with which it was mentioned within each study. As such, each consequence was only counted once within this analysis.

Data presented in the results and discussion sections of each included study were reviewed. Where there was evidence of an association between psychological safety and a linked outcome, this was extracted and coded. Data were reported as a frequency of each possible consequence and the level of psychological safety it was related to (low or high). The nature of these associations was also recorded – whether the conclusions regarding the consequences of psychological safety were the opinion / inferences of the study authors or derived from statistical analysis (46).

3.4.ANALYSIS AND RESULTS

As anticipated, the deliberately broad search strategy initially yielded a large number of papers, with 28,688 titles identified. A significant proportion of the studies (27,820) were excluded at the title review stage as they were very clearly unrelated to the three research objectives.

The abstracts of 868 papers were reviewed; following this 173 were taken forward for full text review as they contained data consistent with the inclusion criteria. At this stage, 14 duplicates were removed, and 105 articles excluded. Of the 68 papers taken forward for data extraction, a further 6 were excluded (these were either from the same research group and used data previously analysed in another included study or did not provide sufficient data within the results section to analyse according to a thematic analysis approach). Sixty-two papers were deemed eligible and were included in this study. The PRISMA flow diagram for this process is illustrated in Figure 7.

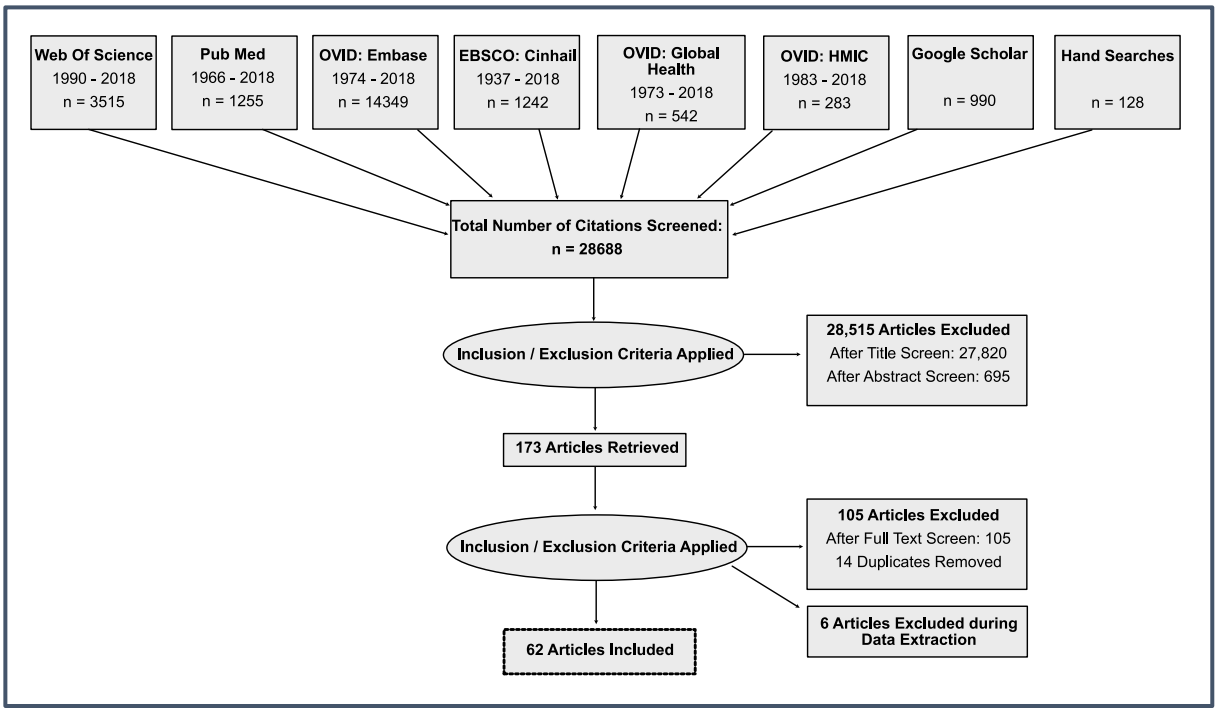


Figure 7. A PRISMA Flow Diagram Demonstrating the Search Results, Process of Screening and Selection of Studies for Inclusion (46, 211).

3.4.1. STUDY CHARACTERISTICS

The study characteristics of the 62 included papers were collated and can be viewed in Table 2. The included studies originated from 19 countries, and in total encompassed 32,677 participants. Sixty were hospital-based studies, with 2 incorporating both primary & secondary care sites. Forty-four papers assessed psychological safety as one of their primary outcomes, 3 listed it as a secondary objective and 15 papers discussed the presence of psychological safety as a theme which emerged in the analysis of qualitative data.

Table 2: Summary of Study Characteristics (46)

Study	Location: Country, Site Type	Clinical Department	Sample of Healthcare workers (n)	Method of Sampling Participants	Study Outcome Measures	Tools Used to Assess Psychological Safety	Research Methodology	Psychological Safety as an Outcome Measure
Abdi et al, 2015 (222)	Iran, Hospital	Intensive Care	Nurses and Physicians (42)	Purposive Sampling Technique	Assessment of Safety Climate within ICU	Qualitative Interviews and Survey Data (SAQ)	Mixed Methods	Theme that emerged during analysis
Alilu et al, 2014 (223)	Iran, Hospital	Multiple Clinical Areas	Nurses (16)	Purposive Sampling Technique	To explore professional challenges in clinical settings and reasons for wanting to leave the profession	Qualitative Interviews - Content Analysis of Transcripts	Qualitative	Theme that emerged during analysis
Alingh et al, 2014 (224)	Netherlands, Hospital	Multiple Clinical Areas	Nurses and Nurse Managers (1073)	Stratified Sampling Technique	To explore the relationships between control-based and commitment-based safety management, climate for safety, psychological safety and nurses' willingness to speak up	Cross Sectional Survey Study	Quantitative - Survey Data	Primary Objective
Attree et al, 2006 (225)	United Kingdom, Hospital	Multiple Clinical Areas	Nurses (142)	Purposive Sampling Technique	To explore factors that influence nurses' decisions to raise concerns about standards of practice.	Qualitative Interviews - Grounded Theory Approach	Qualitative	Primary Objective
Aveling et al, 2015 (226)	East Africa, Hospital	Multiple Clinical Areas	Hospital Staff - all areas (57)	Purposive Sampling Technique	Explore how healthcare workers in two East African hospitals identify and explain the major obstacles to ensuring the safety of patients in their care.	Qualitative Interviews - Thematic Analysis	Qualitative	Theme that emerged during analysis
Baik et al, 2016 (227)	USA, Hospital	Cardiac Unit	Nurses (10)	Convenience Sampling Technique	Explore nurses' experiences and perceptions following a purposeful interprofessional team intervention in practice	Focus Groups - analysis of transcripts	Qualitative	Theme that emerged during analysis
Belyansky et al, 2010 (228)	USA, Hospital	Surgery	Physicians (72)	Stratified Sampling Technique	Does surgical hierarchy interfere with resident voicing concerns about patient safety	Cross Sectional Survey Study	Quantitative - Survey Data	Primary Objective
Churchman et al, 2008 (229)	United Kingdom, Hospital	Multiple Clinical Areas	Nurses (12)	Purposive Sampling Technique	To explore the extent to which nurses are willing to challenge doctors' practice in everyday situations in an acute NHS hospital	Qualitative Interviews - Thematic Analysis	Qualitative	Primary Objective
Edrees et al, 2012 (230)	United Arab Emirates, Hospital	Intensive Care	ICU Staff (369)	Stratified Sampling Technique	To assess perceived barriers to speaking up and to provide recommendation for reducing barriers to reporting adverse events and near misses	Survey with thematic analysis of open-ended questions	Mixed Methods	Primary Objective
Etchegaray et al, 2010 (231)	USA, Hospital	Multiple Clinical Areas	Hospital Staff with direct patient care - all areas (2933)	Stratified Sampling Technique	Creation of a reliable and valid high-performance work system (HPWS) survey and evaluation of this, culture and outcomes	Survey	Quantitative - Survey Data	Primary Objective

Farag et al, 2014 (232)	USA, Hospital	Critical and Acute Care	Nurses (144)	Stratified Sampling Technique	To assess safety motivation - willingness of nurses to report error with 2 aims	Cross Sectional Survey Study	Quantitative - Survey Data	Primary Objective
Garon et al, 2009 (233)	USA, Hospital	Multiple Clinical Areas	Nurses and Nurse Managers (33)	Purposive Sampling Technique	To explore nurses' perceptions of their own ability to speak up and be heard in the workforce	Focus Groups - analysis of transcripts	Qualitative	Primary Objective
Garon et al, 1998, 2004 (234)	USA, Hospital	Multiple Clinical Areas	Nurses (19)	Purposive Sampling Technique	To relate nurses' stories of their experiences of acts of resistance	Qualitative Interviews - Narrative Analysis	Qualitative	Primary Objective
Gauld et al, 2012 (235)	New Zealand, Hospital	Multiple Clinical Areas	Hospital Staff - all areas (10,303)	Stratified Sampling Technique	Measure health professional perceptions of quality and safety across an entire system of public hospitals.	Survey	Quantitative - Survey Data	Primary Objective
Gausvik et al, 2014 (236)	USA, Hospital	Elderly Care	Nurses and Allied Healthcare Professionals (24)	Stratified Sampling Technique	To measure perceptions of teamwork, communication, understanding of the plan for the day, safety, efficiency, and job satisfaction	Survey with thematic analysis of open-ended questions	Mixed Methods	Theme that emerged during analysis
Hemingway et al, 2006 (237)	USA, Hospital	Surgery	Theatre Staff (169)	Stratified Sampling Technique	Assess outcome of process change in the following areas: Safety reporting measures, safety debriefings, audits, communication methods	Survey	Quantitative - Survey Data	Theme that emerged during analysis
Hirak et al, 2011 (238)	Isreal, Hospital	Multiple Clinical Areas	Nurses and Physicians (277)	Random Sampling Technique	Analyse how the behaviour of the leader influences psychological safety and learning from failure	Survey	Quantitative - Survey Data	Primary Objective
Hughes et al, 2014 (239)	USA, Hospital	Emergency Department	Trauma Team Members (132)	Stratified Sampling Technique	Explore changes after implementation of a crew resource management programme	Survey	Quantitative - Survey Data	Primary Objective
Jayasuriya-Illesinghe et al, 2016 (240)	Sri Lanka, Hospital	Surgery	Surgeons (15)	Purposive Sampling Technique	To describe the nature of interprofessional work and the factors that influence teamwork in this setting	Qualitative Interviews - Thematic Analysis	Qualitative	Secondary Objective
Kaafarani et al, 2006 (241)	USA, Hospital	Theatre and Recovery	Theatre and Recovery Staff (324)	Stratified Sampling Technique	To evaluate patient safety culture in the OR and PACU	Survey	Quantitative - Survey Data	Secondary Objective
Kessel et al, 2012 (21)	Germany, Mixed Primary and Secondary	Multiple Clinical Areas	Healthcare teams caring for patients with rare diseases	Stratified Sampling Technique	How does Psychological safety foster knowledge-sharing process and enable team creative performance?	Survey - Edmondson's Tool	Quantitative - Survey Data	Primary Objective

			(149)					
Kobayashi et al, 2005 (54)	USA, Japan. Hospitals	Multiple Clinical Areas	Physicians (240)	Stratified Sampling Technique	To identify perceived barriers to residents' questioning or challenging their seniors, to determine how these barriers affect decisions and to assess how these barriers differ across cultures	Survey	Quantitative - Survey Data	Primary Objective
Kolbe et al, 2012 (242)	Switzerland, Hospitals	Simulator	Anaesthesia Residents and Nurses (62)	Stratified Sampling Technique	To test the relationship between speaking up and technical team performance in anaesthesia	Scored Simulated Encounters	Mixed Methods	Primary Objective
Law et al, 2014 (243)	China, Hospitals	Multiple Clinical Areas	Nurses (18)	Purposive Sampling Technique	To explore the process of learning to speak up in practice among newly graduated registered nurses	Qualitative Interviews - Iterative Analysis	Qualitative	Primary Objective
Livorsi et al, 2014 (244)	USA, Hospital	Intensive Care	ICU Staff (39)	Purposive Sampling Technique	To explore three safety domains: reporting errors, approachability of authority figures and handovers.	Qualitative Interviews - Thematic Analysis	Qualitative	Primary Objective
Lockett et al, 2015 (245)	USA, Hospital	Multiple Clinical Areas	Nurses and Nurse Managers (28)	Purposive Sampling Technique	To define and create a conceptual model for peer-to-peer accountability	Qualitative Interviews - Grounded Theory Approach	Qualitative	Primary Objective
Lyndon et al, 2012 (246)	USA, Hospital	Labour and Delivery Unit	Nurses and Obstetricians (125)	Stratified Sampling Technique	Assessment of likely harm and relationship to speaking up	Survey	Quantitative - Survey Data	Primary Objective
Malloy et al, 2009 (247)	Canada, Korea, Australia, Ireland. Hospital	Elderly Care	Nurses (42)	Purposive Sampling Technique	Identify ethical dilemmas in caring for elderly people with dementia	Focus Groups - analysis of transcripts	Qualitative	Theme that emerged during analysis
Martinez et al, 2014 (248)	USA, Hospital	Multiple Clinical Areas	Interns and Residents (1800)	Stratified Sampling Technique	To compare interns' and residents' experiences, attitudes and factors associated with speaking up about traditional vs professionalism related safety threats	Survey	Quantitative - Survey Data	Primary Objective
Maxfield et al, 2013 (249)	USA, Hospital	Labour and Delivery Unit	Physicians, Midwives and Nurses (3282)	Stratified Sampling Technique	To assess the occurrence of 4 safety concerns among labor and delivery teams: dangerous shortcuts, missing competencies, disrespect and performance problems.	Survey	Quantitative - Survey Data	Secondary Objective
McLinton et al, 2017 (250)	Australia, Hospital	Multiple Clinical Areas	Hospital Staff - all areas (27)	Purposive Sampling Technique	To explore key themes: "whether the organisation valued the psychological safety of the workers as well as physical, and how management practices make workers feel valued	Qualitative Interviews with grounded theory approach to analysis, subsequently linked to survey data	Mixed Methods	Primary Objective
Nembhard et al, 2005 (35)	USA, Hospital	Neonatal Intensive Care Unit	NICU Staff (23)	Purposive Sampling Technique	To test the hypothesis that leader inclusiveness promotes psychological safety	Survey - Edmondson's Tool	Quantitative - Survey Data	Primary Objective

Ortega et al, 2011 (251)	Spain, Hospital	Multiple Clinical Areas	Hospital Staff - all areas (468)	Stratified Sampling Technique	Explore the relationship between team level learning and performance in nursing teams – and the role of beliefs about interpersonal context in this relationship	Cross Sectional Survey Study	Quantitative - Survey Data	Primary Objective
Pian-Smith, 2009 (252)	USA, Hospital	Simulator	Anaesthesia Residents (44)	Purposive Sampling Technique	Evaluate the effect of teaching residents the two-challenge rule	Scored Simulated Encounters	Quantitative	Primary Objective
Piers et al, 2017 (253)	Belgium, Hospital	Elderly Care	Nurses and Allied Healthcare Professionals (890)	Stratified Sampling Technique	To explore the quality of interprofessional teamwork in acute geriatric care and to build a model of team types	Cross Sectional Survey Study	Quantitative - Survey Data	Theme that emerged during analysis
Putnam et al, 2015 (254)	USA, Hospital	Surgery	Theatre Staff (63)	Stratified Sampling Technique	To test the effect of an enhanced safety curriculum	Survey - SAQ	Quantitative - Survey Data	Primary Objective
Raemer et al, 2016 (255)	USA, Hospital	Simulator	Anaesthesia Residents (40)	Stratified Sampling Technique	Three questions: -Would an educational intervention be effective in improving speaking-up behaviours of practicing non-trainee anaesthetists when presented with realistic simulated clinical situations? -What would those speaking up behaviours be? -What were the hurdles and enablers?	Analysis Simulated encounters	Qualitative - coding of simulated encounters	Primary Objective
Rathert et al, 2009 (256)	USA, Hospital	Acute Care	Hospital Staff - all acute areas (306)	Stratified Sampling Technique	To empirically explore a theoretical model linking the work environment in the healthcare setting and how it might relate to work engagement, organisational commitment and patient safety	Survey - Edmondson's Tool	Quantitative - Survey Data	Primary Objective
Richard et al, 2017 (257)	Switzerland, Hospitals	Paediatrics	Nurses and Physicians (523)	Stratified Sampling Technique	To develop a short questionnaire allowing healthcare organisations to assess different aspects of speaking up among healthcare staff	Survey	Quantitative - Survey Data	Primary Objective
Roberts et al, 2014 (258)	USA, Hospital	Paediatrics - General medical and surgical care	Nurses and Physicians (57)	Purposive Sampling Technique	To proactively identify barriers to calling for urgent assistance that exist despite recent implementation of a comprehensive RRS in a children's hospital	Qualitative Interviews - Modified Grounded Theory Approach	Qualitative	Primary Objective
Roussin et al, 2018 (259)	Spain, Hospital	Simulator	Nurses and Physicians (129)	Stratified Sampling Technique	Test the assumption that greater feelings of self-efficacy and psychological safety would be associated with greater speaking up in simulation-based healthcare learning environments	Survey	Quantitative - Survey Data	Primary Objective
Rutherford et al, 2012 (260)	United Kingdom, Hospital	Theatre and Recovery	Anaesthetic Consultants and Assistants (33)	Purposive Sampling Technique	To identify the critical non-technical skills for safe and effective anaesthetic assistant performance	Qualitative Interviews - Thematic Analysis	Qualitative	Primary Objective

Sayre et al, 2012 (261)	USA, Hospital	Acute Care	Nurses (104)	Purposive Sampling Technique	Whether in-service training could lead nurses to speak up, thereby enhancing perceptions of collaboration	Survey - "Speaking Up Measure"	Quantitative - Quasi-experimental research design	Primary Objective
Schwappach and Gering, 2014 (262)	Switzerland, Hospitals	Oncology (Adult and Paediatric)	Oncology Nurses and Physicians (32)	Purposive Sampling Technique	To investigate the motivations and barriers to speaking up towards co-workers and supervisors	Qualitative Interviews - Inductive thematic content analysis	Qualitative	Primary Objective
Schwappach and Gering, 2014 (263)	Switzerland, Hospitals	Oncology (Adult and Paediatric)	Oncology Nurses and Physicians (1013)	Stratified Sampling Technique	To investigate the likelihood of speaking up about patient safety in oncology and to clarify the effect of clinical and situational context factors on the likelihood of voicing concerns	Survey	Quantitative - Survey Data	Primary Objective
Schwappach and Richard, 2018 (264)	Switzerland, Hospitals	Multiple Clinical Areas	Nurses and Physicians (979)	Stratified Sampling Technique	To determine frequencies of healthcare workers speak up-related behaviours and the association of speak up-related safety climate with speaking up and withholding voice	Survey	Quantitative - Survey Data	Primary Objective
Schwappach and Sendlhofer (265)	Switzerland, Austria. Hospitals	Multiple Clinical Areas	Staff working in surgical and anaesthesia department (768)	Stratified Sampling Technique	To compare speaking up related climate and behaviours in academic and non-academic hospitals.	Survey - SUPS-Q	Quantitative - Survey Data	Primary Objective
Schwappach et al, 2018 (266)	Switzerland, Hospitals	Multiple Clinical Areas	Nurses and Physicians (1217)	Stratified Sampling Technique	To investigate speaking up behaviours, safety climate and likelihood to speak up about poor hand hygiene practice descripted in a vignette	Cross Sectional Survey Study - SUPS-Q	Quantitative - Survey Data	Primary Objective
Schwappach and Sendlhofer, 2018 (267)	Austria, Hospital	Multiple Clinical Areas	Hospital Staff - all acute areas (859)	Stratified Sampling Technique	To analyse speaking up behaviour and safety climate with a validated questionnaire for the first time in an Austrian university hospital	Survey	Quantitative - Survey Data	Primary Objective
Sexton et al, 2006 (123)	USA, Hospital	Surgery	Theatre Staff (2135)	Stratified Sampling Technique	To test the psychometric properties of a teamwork climate scale in the OR setting, and to provide some initial benchmarking information on OR teamwork climate by hospital and caregiver type	Survey - SAQ	Quantitative - Survey Data	Primary Objective
Sundqvist et al, 2013 (268)	Sweden, Hospital	Anaesthesia	Nurse Anaesthetists (20)	Purposive Sampling Technique	The aim of the study was to describe advocacy in anaesthesia care during the perioperative phase from the perspective of the registered nurse anaesthetist	Qualitative Interviews - Content Analysis of Transcripts	Qualitative	Theme that emerged during analysis
Sur et al, 2015 (269)	USA, Hospital	Surgery	Surgical Residents (18)	Purposive Sampling Technique	To evaluate trainees approaches to concerns about supervisor's clinical decision making	Qualitative Interviews - Thematic Analysis	Qualitative	Primary Objective

Szymczak et al, 2015 (270)	USA, Hospital	Paediatrics	Physicians (103)	Purposive Sampling Technique	To examine how clinicians talk about speaking up or not in the face of breaches in infection prevention technique	Qualitative Interviews - Thematic Analysis	Qualitative	Primary Objective
Tamuz et al, 2011 (271)	USA, Hospital	Intensive Care	Physicians (17)	Purposive Sampling Technique	To explore how residents in the ICU experienced supervision related to medication safety, not only from supervising physicians but also from other professionals	Qualitative Interviews - Thematic Analysis	Qualitative	Theme that emerged during analysis
Tangirala et al, 2008 (272)	USA, Hospital	Multiple Clinical Areas	Nurses (586)	Stratified Sampling Technique	To investigate the relationship between personal control (employees' perceptions of autonomy and impact at work) and voice (employees' expression of challenging but constructive work-related opinions, concerns or ideas	Survey	Quantitative - Survey Data	Primary Objective
Tarrant et al, 2017 (273)	United Kingdom, Hospital	Intensive Care	ICU Staff (98)	Purposive Sampling Technique	To study how personnel gave voice to concerns about patient safety or poor practice	Ethnographic observations and qualitative interviews - Thematic analysis	Qualitative	Primary Objective
Todorova et al, 2012 (274)	Bulgaria, Hospital	Multiple Clinical Areas	Nurses and Physicians (42)	Purposive Sampling Technique	To explore health professionals' perceptions of organisational hierarchies and how doctors and nurses connect these to organisational justice	Qualitative Interviews - Thematic Analysis	Qualitative	Theme that emerged during analysis
Urisman et al, 2018 (275)	USA, Hospital	Intensive Care	ICU Staff (65)	Stratified Sampling Technique	To evaluate the impact of introducing an interdisciplinary rounding format that formalised the participation of nurses in rounds on the effectiveness of interprofessional collaboration, specifically between nurses and physicians and (ii) to evaluate a possible impact of adopting these rounds on measurable patient outcomes	Survey	Quantitative - Survey Data	Theme that emerged during analysis
Van Bogaert et al, 2015 (276)	Belgium, Hospital	Multiple Clinical Areas	Medical or Surgical Nurse Managers (8)	Purposive Sampling Technique	To study nurse managers' perceptions and experiences of staff nurse structural empowerment and its impact on the nurse manager leadership role and style	Qualitative Interviews - Thematic Analysis	Qualitative	Theme that emerged during analysis
Weiss et al, 2014 (277)	Switzerland , Hospitals	Simulator	Anaesthesia Physicians and Nurses (27)	Purposive Sampling Technique	To investigate individual predictors of speaking up in acute care teams	Scored Simulated Encounters and Survey	Mixed Methods	Primary Objective
Weller et al, 2011 (278)	New Zealand, Primary and Secondary Care	Multiple Clinical Areas	Junior Doctors and Nurses (25)	Purposive Sampling Technique	To understand the nature of the interactions, activities and issues affecting new medical and nursing graduates in order to inform interventions to improve IPC among junior health professions graduates	Qualitative Interviews - Thematic Analysis	Qualitative	Theme that emerged during analysis
Whitehair et al, 2018 (279)	Australia, Hospital	Paediatrics	Nurses (7)	Purposive Sampling Technique	To explore how team processes support nursing teams in hospital units during everyday work	Ethnographic observations - Thematic Analysis	Qualitative	Theme that emerged during analysis

The aims and objectives of all studies were identified and coded. These codes were subsequently collapsed into themes. The theme of "assessing the perceived motivations and barriers to speaking up" was the most frequently studied.

The coding categories and number of papers within each group are outlined in Table 3 (46).

Table 3. Aims of Included Studies (46)

AIMS OF STUDY	NUMBER OF STUDIES
Assess perceived motivations and barriers to speaking up (one study also looked at how these barriers differed across two cultures) (21, 54, 225, 230, 232, 244, 248, 257-259, 262, 263, 272, 273)	14
Assessment of safety climate / culture / quality / teamwork (222, 226, 235, 241, 245, 251, 256, 265, 267)	9
Evaluation of an intervention on speaking up, safety or communication (231, 236, 237, 239, 252, 261, 275)	7
Impact of hierarchy on speaking up (228, 229, 238, 274)	4
To describe the nature of interprofessional work and the factors that influence teamwork (123, 240, 253, 279)	4
Assessment of likely harm and relationship to speaking up (246, 249, 266, 270)	4
Impact of management / leadership on psychological safety (35, 224, 269)	3
Explore perceptions of safety following an interprofessional teamwork intervention (227, 254, 278)	3
To explore perceptions of own ability to speak up and be heard (233, 234, 277)	3
Professional challenges and reasons for wanting to leave (223)	1
Test relationship between speaking up and technical team performance (242)	1
Explore the process of learning to speak up (243)	1
Identify ethical errors in caring for elderly patients with dementia (247)	1
Exploring how the organisation values psychological safety of its workers and makes workers feel valued (250)	1
Identify critical non-technical skills for safe and effective teamwork (260)	1
Assess speaking up behaviour and safety climate (264)	1
Describe advocacy in anaesthesia care (268)	1
Explore experiences of supervision from seniors (271)	1
Observed how staff members spoke up (255)	1
Explore experiences of being a nurse manager (276)	1

3.4.2. ADDRESSING THE RESEARCH OBJECTIVES

Objective 1: Synthesise existing literature investigating psychological safety in healthcare workers

To assess both study participant and overall study conclusions regarding the presence and perception of psychological safety, each included study was reviewed with a focus upon the qualitative data presented (most frequently presented as interview or focus group transcript excerpts, or open-ended survey responses). In addition, conclusions presented within discussion sections were also reviewed. These data responding to psychological safety were extracted and coded. The subsequent codes were organised into a framework that included

data corresponding to psychological safety, the factors influencing its presence and associated themes including error, teamwork and safety.

This allowed the development of an overall understanding and impression of the psychological safety within each study's participant group (categorised as "high", "moderate" or "low"). Sixteen studies demonstrated predominantly low psychological safety (8 qualitative, 5 quantitative and 3 mixed methods). Examples of this included demonstrating nurses not challenging doctors' practice (229) and that both fear of repercussion and unclear expectations limited an individual's psychological safety (244). Only 6 studies (2 qualitative and 4 quantitative) reported a predominance of high psychological safety, highlighting that the importance of preventing harm to patients empowered individuals and improved psychological safety (269). Seven studies reported an improvement in psychological safety after an intervention such as interpersonal team training (227). Fifteen studies did not report homogenous finding for the psychological safety of their participants, with both high and low levels of psychological safety identified within their participant group.

The level of psychological safety identified and themes supporting this conclusion are presented in Table 4.

Table 4. Evidence of Psychological Safety within each Study (46).

Study	Level of Psychological Safety Identified	Themes Supporting Level of Psychological Safety
Abdi et al, 2015 (222)	Generally low - low safety climate, teamwork and job satisfaction scores.	Nursing staff felt discouraged from reporting error due to hierarchy, Nursing staff reported it difficult to express opposing views. This was dependent upon the individuals involved in each interaction.
Alilu et al, 2014 (223)	Low	Blame assigned by management following errors/complaints, Poor support by management. Example: "humiliation harassment and inappropriate treatment by physicians"
Alingh et al, 2014 (224)	Study does not quantify overall level but investigates association between psychological safety and other factors.	Psychological safety positively related to speaking up intentions
Attree et al, 2006 (225)	Both high and low levels of psychological safety reported. Felt to be "High risk, low benefit"	Barriers: fear of repercussions, retribution and blame. Perceptions of a closed, concealing and blaming organisation culture. Facilitating factors: Open culture, perception of raising concerns as professional duty.
Aveling et al, 2015 (226)	Low	"Poor teamwork due to hierarchical dynamics". Staff who were not physicians feeling disrespected. "Failure to act upon concerns raised by colleagues"
Baik et al, 2016 (227)	Improved post intervention (Team building exercise)	Intervention enabled nurses to be an active member of the team. The focus on creating a psychologically safe environment post intervention encouraged them to bring up concerns and issues about patients
Belyansky et al, 2010 (228)	Moderate	Large proportion of participants had seen an adverse event prevented by speaking up. Attendings felt that they encouraged speaking up and welcomed feedback. This theme was not reflected in data from residents
Churchman et al, 2008 (229)	Low	Lots of examples of nurses who did not challenge doctors' practice. Psychological safety assisted by policies or hospital documents.

Edrees et al, 2012 (230)	Statements inferring low levels of psychological safety within paper	Perceptions of a culture of blame and issues with reporting procedures
Etchegara et al, 2010 (231)	Generally high (Agree or strongly agree on Likert scale)	Found that HPWS were a strong predictor of speaking up – better than other tools used
Farag et al, 2014 (232)	Moderate - high scores reflecting willingness to speak up	Authors question scores felt that true score was likely to be lower - “possibility of social desirability associated with study outcome”
Garon et al, 2009 (233)	Both high and low levels of psychological safety reported.	Idea that ability to speak up is shaped by personal experiences and influences at home which are then carried into the workplace. Outcomes: staff want to know the issue they bring up is acted upon. If no response seen deemed pointless to speak up
Garon et al, 1998, 2004 (234)	Both high and low levels of psychological safety reported.	All participants had examples of speaking up. Difficulty reported with hierarchy, but improved with experience.
Gauld et al, 2012 (235)	Moderate	Nurses more likely to speak up than other allied health professionals, older staff more likely to speak up than younger.
Gausvik et al, 2014 (236)	Improved post intervention (Team building exercise)	Patient safety large motivation to speak up: "I feel like I am part of a team dynamic that is really invested in the patient"
Hemingway et al, 2006 (237)	Improved post intervention (Team building exercise)	Patient safety identified as the main motivator to speak up
Hirak et al, 2011 (238)	High scores on survey for psychological safety.	Psychological safety positively related to leader inclusiveness, good unit culture
Hughes et al, 2014 (239)	Low, even despite improvements post intervention.	Improvement in domain: "Staff are afraid to ask questions when something does not seem right"
Jayasuriya-Illesinghe et al, 2016 (240)	Low, Clear examples of observed low psychological safety	Lots of examples of hierarchy affecting psychological safety
Kaafarani et al, 2006 (241)	Moderate - found lower psychological safety within theatre & recovery than in other areas	Mixed themes - "asking for help is a sign of incompetence", however "in my unit, patient safety problems and errors are communicated to the right people so the problem can be corrected"
Kessel et al, 2012 (21)	Examined relationship between psychological safety, knowledge sharing and creative performance	Found that higher psychological safety led to improved knowledge sharing and creative performance
Kobayashi et al, 2005 (54)	Examined for cultural differences between Japanese and US residents - none found.	Psychological safety affected by climate, but that organisational and professional culture can override national culture
Kolbe et al, 2012 (242)	Variable - dependent upon role.	Nurses spoke up more than residents in the simulated scenarios. Were more likely to speak up as the scenario progressed if had spoken up at the start.
Law et al, 2014 (243)	Variable - improved when empowered by supportive seniors and peers to speak up	Benefits of mentors speaking up and leading by example, but that this can also be negative as it suggests you need to be senior to speak up. Speaking up avoided to avoid interpersonal conflict.
Livorsi et al, 2014 (244)	Low	Barriers included: fear of repercussion, unclear expectations, knowledge deficits and a culture of negativity.
Lockett et al, 2015 (245)	High levels of psychological safety, but lots of barriers identified	Recognition that speaking up is an ethical responsibility "to uphold acceptable standards of behaviour and patient care" Barriers Included: Blame culture, current workload, fear of conflict
Lyndon et al, 2012 (246)	Low - even if harm rating high	Harm rating was a predictor of speaking up. Likelihood of speaking up correlated with scores for bravery and assertiveness. Shared mental model crucial for promoting psychological safety. Intimidation by seniors a barrier to psychological safety.
Malloy et al, 2009 (247)	Low, but some variation according to culture.	Lack of empowerment and psychological safety related to hierarchy.
Martinez et al, 2014 (248)	Generally high	Higher willingness to speak up about patient safety concerns as opposed to unprofessional behaviour. Barriers included: fear of conflict, alienation from team members. Facilitators included "evidence that speaking up will lead to meaningful change"
Maxfield et al, 2013 (249)	Low	Paper demonstrated evidence of organisational silence. Barriers included: conflict, fear of retaliation, poor previous experiences
McLinton et al, 2017 (250)	Moderate - but demonstrated room for improvement	Highlighted a need for a positive culture and the crucial role of management in this. Low psychological safety when managers fail to values staff.
Nembhard et al, 2005 (35)	Moderate	Longevity and experience associated with a higher level of psychological safety. Low leader inclusiveness a barrier to psychological safety
Ortega et al, 2011 (251)	Assessed association between psychological safety and team learning	Team beliefs about psychological safety were positively associated with team learning. Poor team learning and negative environment associated with low psychological safety
Pian-Smith, 2009 (252)	Improvement post intervention: simulated encounters and teaching of "two-challenge rule"	Instructional intervention led to an improvement in speaking up - particularly in senior doctors
Piers et al, 2017 (253)	Both high and low levels of psychological safety reported.	Organisational culture crucial for higher psychological safety

Putnam et al, 2015 (254)	Low	Only 30% agreed with the statement "I feel free to question the decisions or actions of those with more authority". Nurses scored more highly for speaking up than residents; and junior residents demonstrated increased willingness compared to senior residents.
Raemer et al, 2016 (255)	Assessed impact of an intervention. No significant different pre or post intervention	"Speaking up behaviours are deeply rooted and difficult to change, at least with education alone. Barriers included: uncertainty, familiarity with team, expected repercussions.
Rathert et al, 2009 (256)	Assessed factors associated with psychological safety	Those with greater continuous quality improvement reported greater psychological safety.
Richard et al, 2017 (257)	Both high and low levels of psychological safety reported.	Different motivations for silence and speaking up - study describes these as separate, multidimensional concepts.
Roberts et al, 2014 (258)	Explored factors promoting psychological safety	Previous positive experiences increased likelihood of speaking up. Barriers: concern regarding response from seniors.
Roussin et al, 2018 (259)	High	Factors promoting psychological safety: Female sex, increased age. Those with greater levels of occupational self-efficacy.
Rutherford et al, 2012 (260)	Moderate - majority would speak up	Theme of using an intermediary to escalate concerns emerged.
Sayre et al, 2012 (261)	Statistically significant improvement in speaking up for those who had undergone the intervention	By discussing patient scenarios, individuals reported an increased number of behaviour options. "An educational intervention can increase nurse's perception of their own abilities to speak up and collaborate"
Schwappach and Gering, 2014 (263)	Moderate	Facilitators: Obligation to speak up for patient safety, and also protect the individual who made the error. Barriers: Not wanting to "humiliate anyone"
Schwappach and Gering, 2014 (262)	Both high and low levels of psychological safety reported.	Potential harm was a strong predictor of the likelihood of speaking up. Barriers identified included: Male sex, younger age, hierarchy
Schwappach and Richard, 2018 (264)	Low - both in terms of withholding voice and speaking up	Encouraging environment was significantly positively associated with speaking up and a lower likelihood of withholding voice. Strong influence of hierarchy on speaking up behaviour
Schwappach and Sendlhofer (265)	Compared speaking up in Academic and Non-academic Centres - higher in academic sites	Most important factor promoting psychological safety: Perceived risk of harm to patient. Same barriers to psychological safety in academic and non-academic sites, but less discomfort felt regarding speaking up in academic sites.
Schwappach et al, 2018 (266)	Moderate to high levels of psychological safety	Higher risk of harm and higher frequencies of past speaking up behaviours were positively associated with likelihood to speak up
Schwappach and Sendlhofer, 2018 (267)	Both high and low levels of psychological safety reported.	Psychological safety lower for healthcare workers with managerial functions
Sexton et al, 2006 (123)	Both high and low levels of psychological safety reported.	Nurses were less positive about speaking up, feeling supported by others, physician-nurse collaboration, conflict resolution and heeding nurse input
Sundqvist et al, 2013 (268)	Moderate	Facilitator: Obligation to act as the patients advocate. Speaking up seen as difficult but an "easy burden to bear" as they felt they had done good for the patient
Sur et al, 2015 (269)	High - majority recalled experiences of speaking up	Concept of measurable harm prompting people to speak up. Factors affecting willingness to speak up: systemic factors, supervisor factors, trainee factors and clinical factors. Decreased willingness to speak up was associated with the perceptions of supervisors as less approachable, less familiar, more senior and more experienced
Szymczak et al, 2015 (270)	Both high and low levels of psychological safety reported.	Consideration of harm to patient from breach in practice, but also potential harm to patient that may be caused by conflict within the team. Importance of team members being in agreement. Significance of behaviour being influenced by previous experiences.
Tamuz et al, 2011 (271)	Moderate - demonstrated room for improvement	Barriers included: embarrassment, concern about "looking stupid or weak". Nurses tended to use more direct language than physicians. Use of deferential language in order to enable raising concerns to seniors.
Tangirala et al, 2008 (272)	Both high and low levels of psychological safety reported.	The relationship between personal control and voice was "u-shaped" – voice was higher at high and low levels of personal control. Individuals who identify with the organisation were more likely to speak up.
Tarrant et al, 2017 (273)	Both high and low levels of psychological safety reported.	Hierarchy a barrier to speaking up. Some physicians reported that direct challenge in the other direction was potentially uncomfortable – fear that the challenge might be interpreted as bullying - "I certainly would find it much easier to challenge one of my medical colleagues than I would a nurse".
Todorova et al, 2012 (274)	Low	Reluctance to speak up as a consequence of prior negative experiences
Urisman et al, 2018 (275)	Large improvement following intervention (Change in ward round format)	Improvement in communication due to improved feelings of inclusion by all team members during rounds
Van Bogaert et al, 2015 (276)	Positive impact of structural empowerment	Improved communication, decision making and feelings of empowerment.

Weiss et al, 2014 (277)	High proportion of participants remained silent even if it would cause a highly critical event	Need to balance between work relationships and patient care. Nurses more likely to speak up to a member of their own team, unlike physicians who would speak up to surgeon
Weller et al, 2011 (278)	Both high and low levels of psychological safety reported.	Need for acknowledgement of individuals contributions to promote future psychological safety. Also identifies problems associated with being "too approachable".
Whitehair et al, 2018 (279)	Moderate	Teamwork requires an individual's confidence in their own abilities. Highlights importance of continual learning and training in successful teamwork.

Qualitative data presented within each study that related to an individual study participant's perception of their own psychological safety (predominantly in the form of verbatim quotes) were identified, extracted and coded into two categories – "high" and "low".

Examples of low psychological safety highlighted the importance of hierarchy and supportive seniors:

> *"a lot of people are still in awe of physicians and will not question physicians"* (246)
>
> *"there is nowhere to turn. They [management] just laugh at you or look through you"* (274)

Data indicating a higher level of psychological safety demonstrated the importance of supportive leadership and shared goals within the team:

> *"everyone's view is listened to, even if it's in the minority"* (238)
>
> *"we'd done a timeout, we knew each other's names, we were all focused on the same thing"* (269)

Coded qualitative data can be viewed in Table 5:

Table 5. Supporting Qualitative Data – Experiences of Psychological Safety (46).

Examples of low psychological safety		**Examples of high psychological safety**	
"you speak and then you keep getting this resistance or this stifling or this intimidation factor and then people start shutting down"	Garon et al (233)	*"I am rewarded for taking quick action to identify a serious mistake"*	Kaafarani et al (241)
"Do we feel free to talk? Absolutely. Does it go anywhere? No"	Garon et al (233)	*"in my unit, patient safety problems and errors are communicated to the right people so the problem can be corrected"*	Kaafarani et al (241)
"asking for help is a sign of incompetence"	Kaarfarani et al (241)	*"unit culture was characterised as having a sense of camaraderie or teamwork with trust and respect"*	Lockett et al (245)
"nothing ever changes so I have stopped trying"	Lockett et al (245)	*"somehow find the strength to dare to speak out and dare to question"*	Sundqvist et al (268)
"a lot of people are still in awe of physicians and will not question physicians"	Lyndon et al (246)	*"we'd done a timeout, we knew each other's names, we were all focused on the same thing"*	Sur et al (269)

"you have many battles to fight with multiple disciplines and that gets exhausting so you learn to pick your battles"	Szymczak et al (270)	*"he was extremely grateful and thanked me profusely in front of everyone…it made me feel so empowered to speak up again"*	Sur et al (269)
"there is nowhere to turn. They [management] just laugh at you or look through you"	Todorova et al (274)	*"I would certainly find it much easier to challenge one of my medical colleagues than I would a nurse"*	Tarrant et al (273)
		"everyone's view is listened to, even if it's in the minority"	Hirak et al (238)
		"There are real attempts to share information throughout the unit"	Hirak et al (238)

There was heterogeneity within the data relating to an individual healthcare worker's psychological safety when extracted data from all 62 papers were collated and analysed, with both positive and negative perceptions reported. As such, it was not possible to draw an overall or generalisable conclusion about the psychological safety of healthcare workers as a collective.

Looking specifically at the quantitative data, the wide range of data collection tools used did not allow for an overall summation and analysis of these data. Consequently, a collective assessment of healthcare workers psychological safety was not possible.

The data in this synthesis did allow for an appreciation of the differing levels of psychological safety within healthcare workers, with both positive and negative experiences reported (46).

<u>Objective 2: Identify the methods used to assess psychological safety in healthcare workers.</u>

During the analysis it became clear that a number of different methodologies were being utilised to identify and explore a climate of psychological safety in healthcare workers. Within the three categories of qualitative, quantitative and mixed methodology, several approaches were taken. These are outlined in Table 6.

Table 6. Methodologies used to assess Psychological Safety in Healthcare Workers (46)

Methodology used to assess Psychological Safety	
QUALITATIVE METHODOLOGY	
Interviews (223, 225, 226, 229, 234, 240, 243-245, 258, 260, 263, 268-271, 274, 276, 278)	19
Focus Groups (227, 233, 247)	3
Simulation (Qualitative Analysis) (255)	1
Ethnographic Observations and Interviews (273)	1
Ethnographic Observations (279)	1
QUANTITATIVE METHODOLOGY	
Survey Data (21, 35, 54, 123, 224, 228, 231, 232, 235, 237-239, 241, 246, 248, 249, 251, 253, 254, 256, 257, 259, 261, 262, 264-267, 272, 275)	30
Simulation (Quantitative Analysis) (252)	1
MIXED METHODOLOGY	
Qualitative Interview and Paired Survey (222, 250)	2
Survey with Qualitative analysis of Open-ended questions (230, 236)	2
Simulation (Qualitative analysis and Quantitative Scoring applied) (242, 277)	2

Within the studies that used quantitative surveys, 9 used existing survey formats, 3 utilised Edmonson's safety tool (26), 3 used the Safety Attitudes Questionnaire (SAQ) (120) and 3 used SUPS-Q (Speaking Up about Patient Safety – Questionnaire) (257). There was an approximate 50:50 split between studies that used qualitative and quantitative methodology with a small proportion (6/62) using mixed methodology. A wide range of qualitative techniques were employed, the most frequent being semi-structured interviews, which allowed participants to explore their own previous experiences. A review of the available topic guides for studies (presented within supplementary data for 3 studies) that used interviews / focus groups showed concordance in the style of questions and topics addressed – including ease in voicing concerns and feelings around speaking up.

In addition to the variety of methods utilised, it became clear during the analysis that the approach to assessing psychological safety also varied. Four different approaches were identified:

1. Participants asked to reflect on their past experiences of psychological safety (n=41)
2. Participants asked to predict how they feel they might behave in hypothetical clinical scenarios (n=8)

3. Evaluation of the change in psychological safety after an intervention (teamworking exercise or structured ward rounds) (n=9)
4. Participants observed during simulated scenarios as a technique to explore their psychological safety. (n=4)

Whilst this was not acknowledged within any of the published papers, it is possible that the approach to assessing psychological safety has potential to introduce bias – there is a potential for a different response when asking participants what they *would* do in a situation, rather than recalling past experiences (46).

Objective 3: Identification of any consequences of low or high psychological safety

The content analysis identified 18 studies that reported or investigated outcomes associated with psychological safety or inferred consequences as a result of the climate of psychological safety identified.

Within this subgroup were 9 quantitative studies using surveys, 8 qualitative studies (6 utilised interviews and 2 used focus groups) and 1 study using simulation and subsequent quantitative scoring of observed interactions.

Five studies found 8 statistically significant relationships between the presence of psychological safety and a defined outcome measure – with high psychological safety being positively related to creative performance and knowledge sharing (21), technical team performance (242), improving continuous quality improvement (256) and patient centred care (256). Psychological safety was positively associated with learning from failure and improved performance (238). Low psychological safety was negatively correlated with speaking up and withholding voice (257). The remaining studies in this subgroup used data reported by participants about their experience in the clinical environment to infer correlations and associations between psychological safety and possible consequences. The most commonly inferred association reported by study authors was that low psychological safety had a negative impact on patient risk of harm, identified in 10 studies (46).

The data regarding the potential consequences and the nature of each association can be viewed in Table 7.

Table 7. Possible Consequences of High or Low Psychological Safety (46).

Paper	Research Methodology	Aims	Analysis	Potential Consequence Identified	Nature of relationship	Causal or Correlational
Kessel et al (21)	Quantitative - Survey	"Examine psychological safety as a mediator of the relationship between knowledge sharing and creative performance"	Latent class regression analysis	Positive relationship between psychological safety and creative performance ($p < 0.05$)	Statistically significant	Causal (authors state that lack of experimental design means this cannot be ensured)
				Positive relationship between psychological safety and knowledge sharing ($p < 0.05$)	Statistically significant	Causal (authors state that lack of experimental design means this cannot be ensured)
Kolbe et al (242)	Quantitative - Simulator, Prospective observational study	"To test the relationship between speaking up and technical team performance in anaesthesia"	Linear regression	Positive relationship between speaking up behaviour and technical team performance in nurses ($p=<0.017$)	Statistically significant	Correlational
Richard et al (257)	Quantitative - Survey	"To develop a short questionnaire allowing healthcare organisations to assess different aspects of speaking up among healthcare staff"	Principle component analysis	Healthcare workers without managerial responsibilities had lower psychological safety for speaking up than those with managerial roles.	Statistically significant	Correlational
			Content validity	Psychological safety for speaking up was negatively correlated with withholding voice and speaking up (-0.53, -0.23)	Statistically significant	Correlational
Sundqvist et al (268)	Qualitative - Interview	"The aim of the study was to describe advocacy in anaesthesia care during the perioperative phase from the perspective of the registered nurse anaesthetist"	Qualitative Content Analysis	Increased self-esteem associated with speaking up and good teamwork (markers of psychological safety)	Qualitative Theme	Correlational
Aveling et al (226)	Qualitative - Interview	"Explore how healthcare workers in two East African hospitals identify and explain the major obstacles to ensuring the safety of patients in their care."	Qualitative Thematic Analysis	Highlights many factors associated with low psychological safety and links these to poor patient outcomes	Qualitative Theme	Causal - perceived by authors
Belyansky et al (228)	Quantitative - Survey	"Examine the factors that influence surgical trainees in expressing their opinion in the operating room and the consequences this might have on patient safety"	Chi Squared, Fisher exact tests and Wilcoxon rank sum test	Communication between resident and attending can prevent adverse patient events, influenced negatively by hierarchy	Reported by study participants	Causal - perceived by authors
Garon et al (233)	Qualitative - Focus Group	"To explore nurses' perceptions of their own ability to speak up and be heard in the workforce"	Thematic Content Analysis	Infer that low psychological safety can be harmful for patients	Qualitative Theme	Causal - perceived by authors

Garon et al (234)	Qualitative - Interview	"To relate nurses' stories of their experiences of acts of resistance"	Narrative Analysis	Highlights many factors associated with low psychological safety and links these to poor patient outcomes, retaliation and financial impact	Qualitative Theme	Causal - perceived by authors
				Positive relationship between psychological safety and feelings of empowerment and organisational change	Qualitative Theme	Causal - perceived by authors
Kaafarani et al (241)	Quantitative - Survey	"To evaluate patient safety culture in the OR and PACU"	Measured percent problematic response	Infer that low psychological safety and poor communication can be detrimental to patient safety	Reported by study participants	Causal - perceived by authors
Kobayashi et al (54)	Quantitative - Survey	"To identify perceived barriers to residents' questioning or challenging their seniors, to determine how these barriers affect decisions and to assess how these barriers differ across cultures"	Descriptive Statistics	Inference that participants would not speak up to prevent error	Reported by study participants	Causal - perceived by authors
Livorsi et al (244)	Qualitative - Interview	"To explore three safety domains: reporting errors, approachability of authority figures and handovers."	Thematic Analysis	Highlights many factors associated with low psychological safety and links these to poor patient outcomes	Qualitative Theme	Causal - perceived by authors
Lyndon et al (246)	Quantitative - Survey	"Assessment of likely harm and relationship to speaking up in response to perceived harm"	Descriptive statistics and bivariate analyses	Risk of harm to patients associated with low psychological safety	Inferred by authors	Causal - perceived by authors
Maxfield et al (249)	Quantitative - Survey	"To assess the occurrence of 4 safety concerns among labor and delivery teams: dangerous shortcuts, missing competencies, disrespect and performance problems."	Descriptive Statistics	Low psychological safety undermined patient safety, harmed patients and led to staff leaving	Reported by study participants	Causal - perceived by authors
Rathert et al (256)	Quantitative - Survey	"To empirically explore a theoretical model linking the work environment in the healthcare setting and how it might relate to work engagement, organisational commitment and patient safety"	Latent regression analysis	Continuous quality improvement significantly and positively related to psychological safety Patient centred care significantly and negatively related to psychological safety	Statistically Significant	Correlational
Schwappach et al (263)	Qualitative - Interview	"To investigate the motivations and barriers to speaking up towards co-workers and supervisors"	Thematic Content Analysis	Low psychological safety and reluctance to speak up linked to a negative impact on patient safety	Inferred by authors	Causal - perceived by authors
Hirak et al (238)	Quantitative - Survey	"Analyse how the behaviour of the leader influences psychological safety and learning from failure"	Descriptive and correlational statistics	Psychological safety climate positively associated with unit learning from failure ($p<0.01$)	Statistically significant	Correlational

				Psychological safety climate positively associated with unit performance ($p<0.05$)	Statistically significant	Correlational
Malloy et al (247)	Qualitative - Focus Groups	"Identify ethical dilemmas in caring for elderly people with dementia"	Thematic Content Analysis	Low psychological safety risked moral distress for staff	Qualitative Theme	Causal - perceived by authors
Alilu et al (223)	Qualitative - Interview	"To explore professional challenges in clinical settings and reasons for wanting to leave the profession"	Thematic and Content analysis	Factors related to low psychological safety associated with increased intention to leave profession	Qualitative Theme	Causal - perceived by authors

3.4.3. THEMATIC ANALYSIS

Qualitative data extracted during the thematic analysis approach used to answer the first research objective were re-reviewed. This process led to the development of two themes: "the influence of situational context on the psychological safety of healthcare workers", and "detail on facilitators and barriers to psychological safety". These themes contain novel findings that go beyond the content of the included studies and add to the current body of evidence regarding psychological safety.

3.4.3.1. Influence of Situational Context on Psychological Safety

The analysis demonstrated that many of the described examples relating to psychological safety related to the specific situational context that was associated with the event. Situational context can be defined as "*variables that influence or could influence the 'independent' and 'dependent' variable directly under study*" (280). It was noted during the initial reviews of the data that situational context was a recurrent theme within the data. Subsequently, examples of situational context and their relationship to psychological safety were explored within the data in a three-stage process. Firstly, the data were re-reviewed for evidence relating to situational context. Secondly, the relationship of these data to the presence of psychological safety was identified, and the nature of these relationships coded. Finally, the influence of situational context on the healthcare worker or clinical situation was analysed, relating this to the presence of psychological safety.

It is known that psychological safety has an impact at several levels within the workplace – be that individual, team or organisational. The resulting analysis was organised into a model according to the level within the workplace that each episode of situational context was likely to occur (Figure 8) (46).

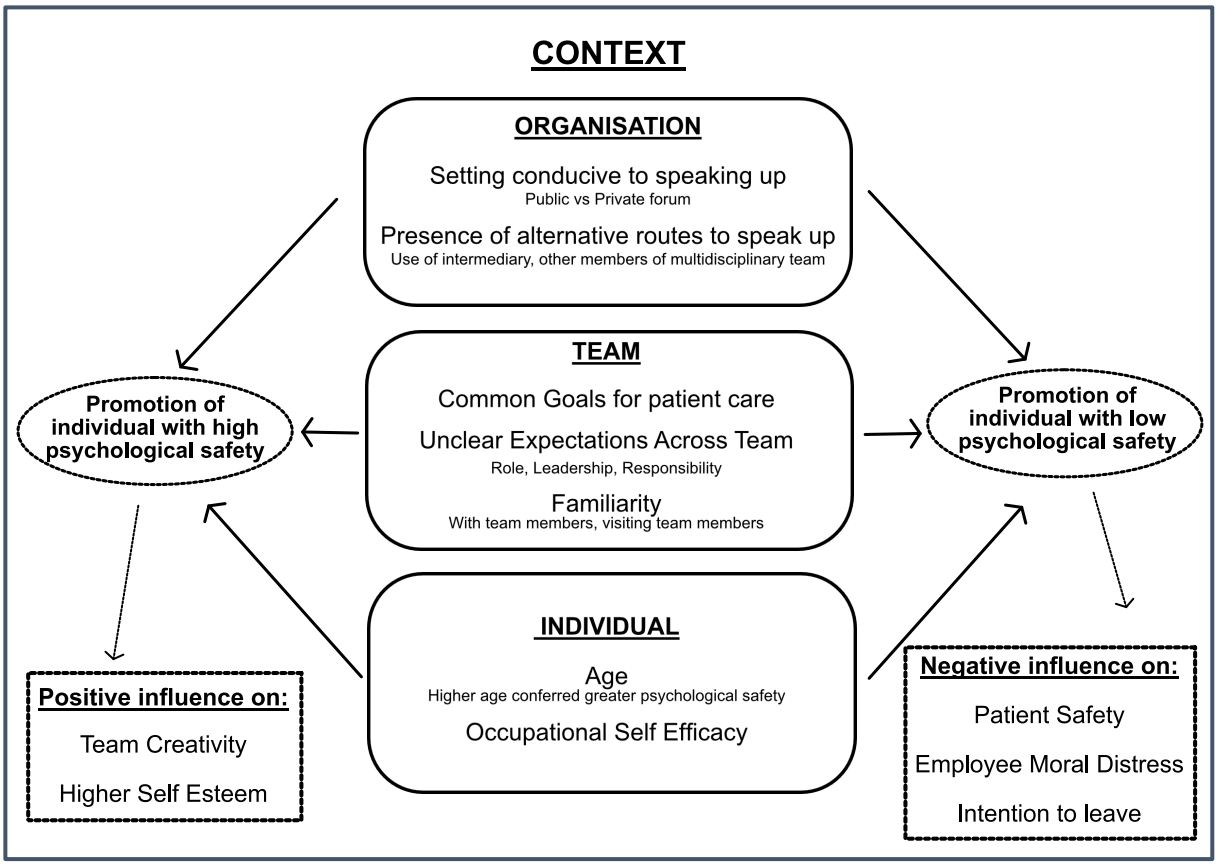


Figure 8. A Model Illustrating the Influence of Situational Context on Psychological Safety within the Healthcare Environment (46).

3.4.3.2. Detail on Facilitators and Barriers to Psychological Safety

Upon review of the data, it was noted that there was a wealth of detailed information regarding the facilitators and barriers to an environment of psychological safety. These descriptive items were coded, and subsequent analysis allowed them to be organised into 9 higher order categories. These were culture, safety, workload, infrastructure, confidence, occupational self-efficacy, teamwork, ability and motivation. These categories and supporting data can be viewed in Table 8.

The categories relating to facilitators and barriers were organised into a framework (Figure 9) that reflected where within the workplace (individual, team or organisation) they originated or appeared to have the most impact. It was possible for a factor to be relevant at more than one level.

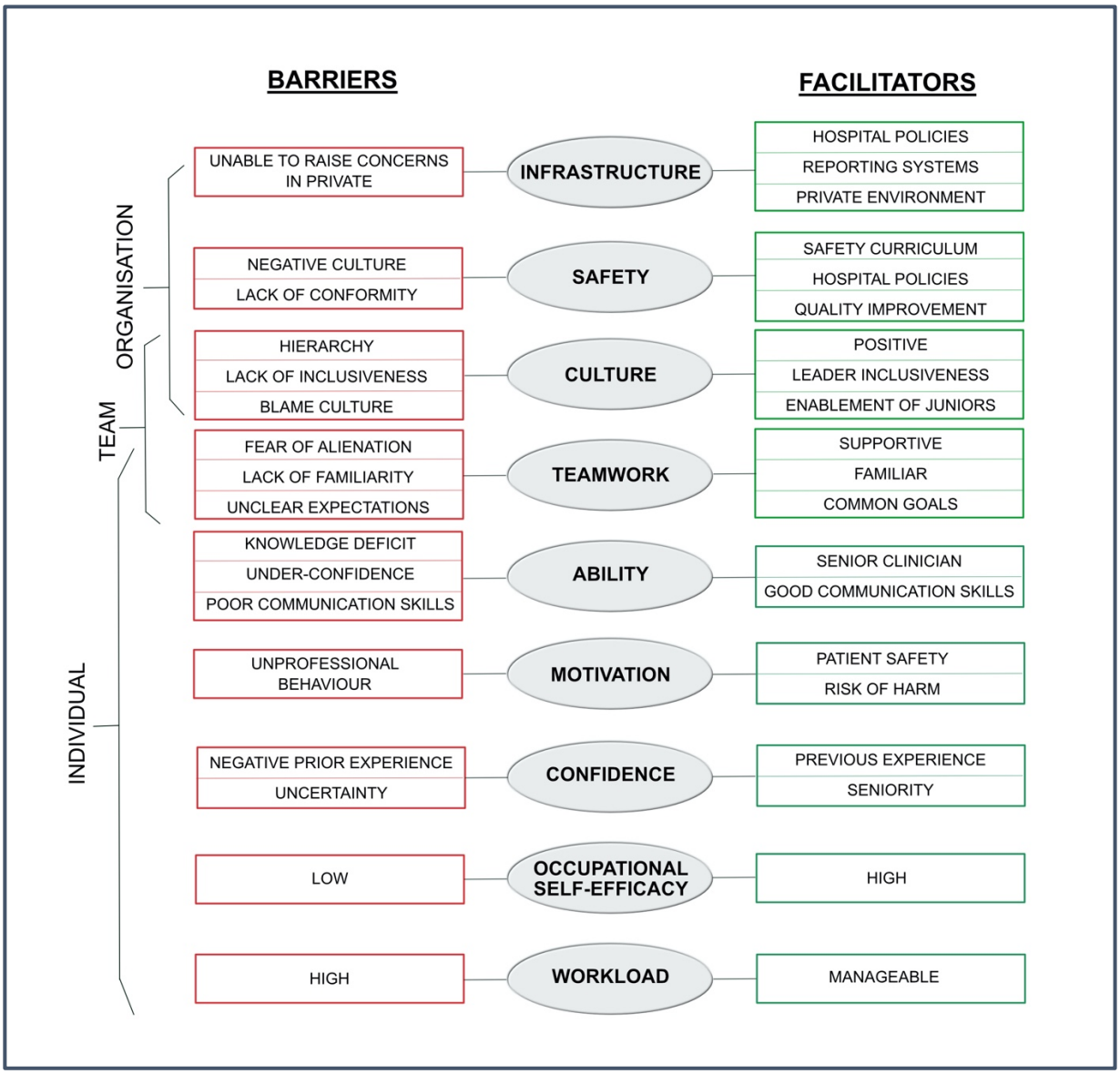


Figure 9. A Framework Illustrating the Barriers and Facilitators to Psychological Safety and where they had Impact within the Workplace (46).

Table 8. Facilitators and Barriers to Psychological Safety as identified in the Thematic Analysis (46).

THEME	FACILLITATORS	Examples of Supporting Data	BARRIERS	Examples of Supporting Data
CULTURE	Creation of a positive culture by management Leader inclusiveness Positive environment Encouragement of questions from senior staff Enablement of nursing staff to be an active member of the team Use of an intermediary to escalate concerns	*"everyone's view is listened to, even if it's in the minority"* *"There are real attempts to share information throughout the unit" (238)* *"a facilitating organisational culture being open, where raising concerns was perceived as a professional duty and responsibility"(225)* *"I trust my manager, I have absolute confidence in her. I am confident that my manager would support me totally"(225)* *"I think you set a culture for nurses to speak up…it seems like the timing and respectfulness and the openness is more available"(227)* *"usually they'll sweep back to you and say 'do you have any thoughts' 'did you have anything you wanted to add'?"(227)*	Hierarchy and fear of challenging authority Fear of repercussion: permanent record, "being shot down" Lack of leader inclusiveness Blame culture Staff members feeling under-valued Uncertainty of recipient's response	*"you speak and then you keep getting this resistance or this stifling or this intimidation factor and then people start shutting down" (233)* *"a nurse who demonstrates being more knowledgeable than a doctor (by speaking up) is seen as stepping outside of her role. If this were to happen, a surgeon would reinstate his hierarchy when the opportunity arises" (240)* *"there is nowhere to turn. They [management] just laugh at you or look through you" (274)* *"I think they look down on you" (222)* *"instead of thanking me, the supervisors reprimanded me, which I didn't expect" (222)* *"Management only assigned blame, instead of finding a solution" (223)* *"we're the ones that get the blame for everything" (225)* *"they don't even listen to you" (226)* *"many of us are very sad for the fact that physicians have such high status in the hospital, especially male doctors, and we [nurses] are treated as worthless" (223)*
SAFETY CULTURE	Use of policies and hospital documents Enhanced safety curriculum Enablement of nursing staff to be an active member of the team Evidence of continuous quality improvement	*"nurses who perceive that their direct supervisor shows commitment and role modelling behaviour, creates awareness and encourages them to participate perceive the environment to be psychologically safe for taking interpersonal risks" (224)* *"structured rounding format and communication tools…enabled nurses to be an active member of the team and provided a safe environment for them"(227)*	Negative culture of conformity to instructions of senior nurses / doctors. Lack of feedback from incident reporting	*"unit characterised as mistrustful, uncivil or negative". (245)* *"whenever an error happens, we could say that the person has been either incompetent or reckless" (222)* *"they gave me a medication error reporting form which I filled and submitted, but I never received feedback and there was no follow up either" (222)a*
WORKLOAD	Manageable	*"I think [I feel] better job satisfaction because of my workflow…it's a more effective use of my time" (227)*	High	*" you have many battles to fight with multiple disciplines and that gets exhausting so you learn to pick your battles" (270)* *'there is high levels of stress associated with accomplishing the tasks on time"(223)*

INFRASTRUCTURE	Policies & hospital documents Good reporting systems Private location for raising concerns	*"in my unit, patient safety problems and errors are communicated to the right people so the problem can be corrected" (241)*	Public location for raising concerns Responsible for several locations	*"the public space is considered unsafe when the dynamic flow of people in the situation is unsupportive and unwilling to listen"(243) law et al* *"less likely to speak up towards the senior physician…in a public forum when several other HCPs are present" (263)* *"as the doctors and nurses in any team looking after a particular patient were all members of multiple and different care teams, this made it difficult for them to meet together at the same time to share information" (278)* *"because the nurses were with patients constantly, they felt they could pick up subtle changes but not always adequately convey their concerns to medical staff" (278)*
CONFIDENCE	Positive Previous Experience of speaking up Own clinical experience Action resulting from previous episodes of speaking up More senior professional status Older Staff Members	*"I am rewarded for taking quick action to identify a serious mistake" (241)* *"nurses willingness to speak is mainly driven by the confidence that raising patient safety concerns will not have negative personal consequences" (224)* *"raising concerns would depend on individuals, the level of the nurse, how strongly they felt it was unacceptable and how assertive and confident they were in themselves to be able to raise it" (225)*	Negative previous experience Fear of being disrespectful Fear of losing professional respect Fear of challenging authority Lack of feedback from previous experiences of speaking up Fear of managing potential conflict Uncertainty regarding issue to be raised Fear of repercussion	*"fear that negative consequences would result" (225)* *"indecision and hesitancy were attributed to fear of repercussions, retribution, labelling and blame for raising concerns" (225)* *"low likelihood of positive action resulting from raising concerns" (225)* *"they feel that nothing is being done, sometimes you get a response or feedback and sometimes – often you don't" (225)* *"feeling self-conscious about asking questions about their patients" (227)*
OCCUPATIONAL SELF EFFICACY	High	*"participants with greater occupational self-efficacy were significantly more likely to speak up when unclear about something explained" (259)*	Low	
TEAMWORK	Shared Mental Model Supportive seniors Common goals for patient care Familiarity with team members	*"was lucky that I felt comfortable approaching the anaesthetist because I knew who he was" (260)* *"unit culture was characterised as having a sense of camaraderie or teamwork with trust and respect" (245)* *"knowing and understanding long-term plans for patient care would be helpful"(227)*	Retaliation from colleagues Alienation from team Unclear expectations Lack of familiarity	*"I think there are doctors who do not know the real meaning of teamwork…they don't realise that our viewpoint, as members of the medical team, should also be considered" (222)* *"in some wards there is envy, jealousy, bickering and backstabbing among the healthcare providers, creating a negative atmosphere with conflicts"(223)*

				"trust takes time to develop…you don't really know the people there and you don't know if you can trust them" (278)
ABILITY	Level of Clinical Experience Communication Skills	*"strongly determined by seniority" (263)*	Knowledge deficit Communication skills Unconfident in clinical skills	*"asking for help is a sign of incompetence" (241)*
MOTIVATION	Patient safety Concerns Risk of serious harm	*"Fighting for our patients" (233)* *"there are times when a patient's life is at risk and I could not remain silent" (222)* *"they have a professional duty to do something" (225)*	Unprofessional behaviour Professional concerns	*"if I think the risk to the patient is relatively low…that's probably something I wouldn't be as aggressive about speaking up on"(269)* *"The problem had to be big enough to motivate them to speak up" (245)* *"some prefer not to do so for legal reasons" (222)a*

3.4.4. QUALITY APPRAISAL

Twenty-eight of the studies included used a purposive sampling technique. This is a well utilised sampling technique within qualitative research and provides a representation of the sample population studied (rather than being generalisable across a wider population). It is possible that within each study population there are individuals who were not represented, possibly due to participation bias – those with an interest in quality and safety may be more likely to participate in such studies. It is also impossible to generalise the findings of one paper to the entire population of healthcare workers.

However, sampling for *proportionality* was not the main concern within these studies, therefore a potential bias in recruitment is unlikely to be detrimental to the overall conclusions of each study and this evidence synthesis.

Studies that were wholly qualitative in nature were less susceptible to selection bias than those who applied a stratified sampling technique (for example those who distributed surveys to entire departments and relied on individuals motivated to participate), given the fact they recruited until thematic saturation was achieved.

Given the desired outcomes of each study, and of this evidence synthesis, no study was rejected due to risk of bias or methodological limitations (46).

3.5. DISCUSSION

Completion of this evidence synthesis collated a huge range of worldwide data, providing detailed insights into the psychological safety of healthcare workers and how it has been investigated. As well as being the largest collation of papers exploring the topic of psychological safety to date, the analysis generated two novel themes regarding the manifestation of psychological safety in the healthcare setting. The synthesis builds upon existing knowledge (such as the importance of leader inclusiveness (28)) and models created by previous reviews (37, 38, 281) about the relationships contributing to psychological safety at the individual, team and organisational level.

Psychological safety was consistently shown to be present in healthcare professionals across the synthesised studies, which is reassuring for healthcare leaders. However, the heterogeneity of responses included individuals reporting feelings and behaviours consistent

with low psychological safety – indicating that there is still scope for modifications and changes in behaviour that might lead to improvement, both for individual workers and the safety of the organisation itself.

The evidence synthesis demonstrated that there was very little consistency in the methods used to assess psychological survey, with authors often creating their own tools / surveys even though validated ones are easily available.

Several studies indicated that psychological safety had a significant benefit on the working environment, particularly teamwork, team creativity and quality improvement. Whilst no studies provided statistically significant evidence of correlations between low psychological safety and adverse outcomes (impossible in the case of the qualitative studies) there was a strong feeling that this had a negative impact on patient safety. This was predictable based upon prior research; but it was also interesting to observe some of the potential consequences for the individual worker – low self-esteem, increased intention to leave the profession and risk of moral distress. No studies were designed with this outcome in mind, and as such these are opinion at best, but the signal that low psychological safety is detrimental both to the service delivered and the individual healthcare worker is present and warrants further investigation.

The analysis within this evidence synthesis provided a detailed explanation regarding the influence of situational context on psychological safety within the healthcare sector. The nature and influence of this context will change depending upon the factors associated within each clinical event. For example, it was noted that at the organisational level, the setting for speaking up had an impact on an individual's psychological safety, with public spaces diminishing such an environment. An individual may feel confident to speak up in the context of a private setting but be intimidated or feel constrained in a more public setting.

There are a number of ways in which this understanding of the influence of situational context on psychological safety can be useful for healthcare managers and team leaders.
Organisational culture has an impact on situational context and the consequential perception of a psychologically safe environment. Changing the culture of an organisation, with a view to

improving psychological safety, can be challenging due to the presence of multiple stakeholders and the complexities associated with healthcare (282). Team leaders have a crucial role in mitigating these challenges and promoting a psychologically safe environment through leadership behaviours such as inclusiveness and being change oriented (55). The model developed during the analysis demonstrating the influence of situational context provides a framework for team leaders wanting to implement change. The model facilitates an understanding and subsequent management of the dynamics associated with situational context within the healthcare environment. The model also highlights how context can affect the perception of psychological safety by an individual, with certain contextual factors promoting either high or low psychological safety. In practice this understanding of context is related to a leader's situational awareness (283). If leaders understand where scenarios leading to low psychological safety may arise, they can use this framework to identify potential issues within the workplace, classify them as relevant and project the potential impact. Through this, leaders may be able to modify the situational context and subsequently improve psychological safety.

A very clear theme regarding the facilitators and barriers to psychological safety experienced by individual healthcare workers worldwide emerged during this thematic analysis. Whilst the theme itself is not novel, the level of detail provided within this analysis is unique. Many of these barriers and facilitators are evidenced by existing literature – such as an individual's confidence, supportive senior staff and management, feedback from previous episodes of speaking up and the presence of a strong hierarchy (35). Barriers to speaking up less commonly acknowledged within the existing literature included the influence of an individual's current workload, the reason itself for speaking up (patient safety was a big motivator, however if related to unprofessional behaviour individuals appeared less likely to speak up) and fear of conflict in front of patients. It is not surprising that effective reporting channels, all members of the team feeling enabled, and high occupational self-efficacy were key in promoting psychological safety. These are examples of both organisational factors (the improvement of reporting channels and feedback to individuals), and individual factors – improving confidence and knowledge base (46).

Since completion and publication of this evidence synthesis, psychological safety in healthcare workers has remained an ongoing topic in healthcare services research. A systematic review of 36 articles was published in 2020 focusing upon the enablers to psychological safety within the healthcare environment (209). This study identified 13 enablers to psychological safety, again categorised into organisational, team and individual levels. Enablers included safety culture at the organisational level, leader support at the team level and professional responsibility at the individual level. This research group also explored the influence of psychological safety specifically at the individual level, finding that the influence of leadership, interpersonal relationships and an individual's characteristics were all important in the manifestation of psychological safety and voice behaviour.

A cross-sectional questionnaire of 165 healthcare workers corroborated the findings of this synthesis (284), highlighting the important of management inclusivity and commitment to safety in promoting an environment of psychological safety.

In response to calls for an improvement in the methodology used to assess psychological safety in healthcare workers, a key need as identified within this study, a composite tool has been developed by one research group (285), using existing measures and adapted with input from health professionals (286). It has also been proposed that there is a positive relationship between "organisational compassion" and psychological safety, and that workplace bullying has a negative impact upon psychological safety in healthcare workers (287).

In part this ongoing research into psychological safety in healthcare has been stimulated by the COVID-19 pandemic, with researchers recognising the likely impact of the pandemic upon the presence of psychological safety (288). A recent study of 443 nurses working through the COVID-19 pandemic concluded that their risk of "burnout" was reduced by their managers operating a "servant leadership" style, and that psychological safety was one of the "critical preconditions" for reducing burnout (289).

3.5.1. LIMITATIONS

There are several limitations of this evidence synthesis. Despite the very broad search strategy, there remains a risk that some qualitative papers did not appear within the search due to unreliable qualitative indexing. However, the large number of papers within this

synthesis provides confidence that thematic saturation was achieved for the novel analytical themes. As a result the impact of not including some qualitative papers is unlikely to be significant.

It was noted during the analysis that there were four main approaches when assessing psychological safety. Asking participants to reflect on their previous behaviour assumes that their recollection is reliable. When asked to predict future behaviour, there is a risk that participants will modify their responses to what they believe is a favourable answer – individuals are unlikely to volunteer behaviours that may be detrimental to patient safety. Whilst this does not impact conclusions drawn about individuals' perception of their psychological safety, it may influence inferences regarding the overall presence of psychological safety.

The possibility of selection bias within individual papers, or that entire populations may not be accurately represented (particularly in relation to quantitative surveys with lower response rates) was acknowledged during the process of this evidence synthesis. Given the aim of this study was to explore psychological safety, the themes and concepts drawn from the data are still extremely useful, even if some surveys had the potential for a negative selection bias (i.e., only those who had conflict / dissatisfaction to report volunteered to participate). It is also possible that centres participating in studies investigating teamwork & safety were more aligned to these ideals in the first place, thereby introducing the possibly of some sampling bias.

3.6. CONCLUSIONS AND INFLUENCE ON FUTURE RESEARCH WITHIN PHD PROGRAMME

This evidence synthesis provided a great understanding of the current research and ideas regarding psychological safety in healthcare workers, and an excellent platform from which to design future studies and analyses. It highlighted that psychological safety is not as prevalent within this workforce as might be desired. The study also demonstrated the need for further research into the manifestation of such an environment, and what modifiable factors team leaders can address to ensure its existence. This search for modifiable factors is a prominent theme throughout this PhD programme.

Learning from my experience completing this evidence synthesis, were I to undertake a similar project I would refine the search strategy slightly to reduce the number of papers identified in the initial search. Whilst a broad search strategy is required in the light of less robust indexing to identify all relevant qualitative articles, it would likely have been possible to achieve this with a slightly stricter search criteria. However, the thoroughness of my approach in this evidence synthesis provides confidence that as much data as possible was included when answering all three research objectives, ultimately supporting the broad approach to a search strategy used.

Building on the findings of this evidence synthesis, the influence of situational context was identified as a potential point of analysis for the first large mixed methods study in this programme (Chapter 4). In addition, the improved understanding of the facilitators and barriers to a psychologically safe environment informed the development of future topic guides, providing direction for the ongoing exploration of psychological safety.

4. CHAPTER 4: ATTITUDES TO SAFETY WITHIN THE CRITICAL CARE ENVIRONMENT AND THE PRESENCE OF PSYCHOLOGICAL SAFETY – A QUALITATIVE INTERVIEW AND QUESTIONNAIRE STUDY

4.1.INTRODUCTION

4.1.1. RATIONALE FOR STUDY

The ensuing aims of this PhD programme were to build upon the knowledge of psychological safety gained through the evidence synthesis (Chapter 3) and address gaps identified. This was to be addressed through the study of psychological safety in NHS workers, focusing upon those working in the critical care environment. The evidence synthesis provided novel data on the influence of situational context, and one objective was to investigate whether this effect was also present in the critical care setting.

As outlined in section 1.1.2, psychological safety is known to be associated with an environment that can enhance patient safety by facilitating an individual's confidence to speak up and identify errors (290). Consequently, this study was designed to explore staff attitudes to safety, teamwork and error-reporting, relating these to the potential presence of psychological safety.

The critical care environment is known to be a stressful environment. Staff are required to care for the most seriously unwell patients in the hospital, often within the constraints of extremely limited resources (83, 291) (1.1.1.3). The stress felt by staff members is not solely created by the requirements of caring for sick patients but is influenced by the workplace environment itself (1.1.3).

The intention behind this study was to provide an understanding of the factors within critical care that contribute to psychological safety and stress; and how these contribute to the presence of a cohesive working environment. It was designed to provide data and evidence that would address elements of all four research questions within this Thesis:

1. What is the presence and consequence of psychological safety within the healthcare workforce?

2. What factors influence a psychologically safe environment within the workforce, with particular focus upon the influence of personality.

3. What factors contribute to the presence of stress within the workforce, with particular focus upon the influence of the workplace environment.

4. How do psychological safety and stress impact individual wellbeing and organisational safety?

4.1.2. RESEARCH OBJECTIVES

Keeping the overall research questions and intentions of this Thesis in mind, the following specific research objectives were designed for this study:

1. To investigate the presence of psychological safety within individuals working in the critical care environment, namely to:
    - Establish whether our study participants believed themselves to be working in a clinical department that was psychologically safe.
    - Explore how situational context influences the presence of psychological safety within the clinical environment, and what contextual factors are important at different levels within the organisation.

2. To explore the safety attitudes of the multi-disciplinary team in the critical care setting.

3. To investigate the impact of the workplace environment of the critical care unit.

4.2. PRELIMINARY WORK: "THE FACULTY OF INTENSIVE CARE MEDICINE WORKFORCE SURVEY – WHAT IMPACTS ON OUR WORKING LIVES"

The topic guide and initial experimental design were informed in part by a piece of preliminary work. The Faculty of Intensive Care Medicine (FICM) performs a yearly survey, capturing data regarding the current workforce. Data were obtained from critical care consultants on the workforce profile, working patterns and future career plans, whilst also providing the opportunity for participants to elaborate on any areas of concerns.

This piece of exploratory work indicated that there was some dissatisfaction within critical care consultants, and the contributing factors acknowledged within the survey (such as limited resources, high workload and the requirement for out of hours working) are likely to affect other members of the multidisciplinary team. As such, the conclusions of this piece of work provided great insights into the causes of stress and discontent, and how this may impact career longevity and intention to leave. These data and understanding were used to inform the topic guide for this study, particularly with respect to the psychological impact of organisational structure and the workplace environment (292).[6]

4.3. METHODS

4.3.1. RECRUITMENT

Participants were recruited from three Intensive Care Units within Imperial College NHS Trust (2.2.3). A purposive sampling approach was employed to ensure that the participant group reflected a typical NHS critical care workforce – both in terms of seniority and staff from different disciplines. Participants were invited to join the study via email, or through advertisement via channels within Imperial – through physical posters, advertisements placed within the critical care units' social media channels or through short presentations at staff meetings. Once a participant accepted the invitation to join the study, they were provided with written information in the form of a participant information sheet.

---

[6] This preliminary work was published in the Journal of Intensive Care Medicine (JICS) as open access has been re-used in this chapter in accordance with Guidelines for SAGE Authors. (SAGE Publishing). 292. Grailey K, Bryden D, Brett S. The Faculty of Intensive Care Medicine Workforce Survey–What impacts on our working lives? Journal of the Intensive Care Society. 2019;20(2):111-7.
Contributor Statement: KG and SJB conceptualised and designed this study. KG was responsible for data extraction and overall data analysis. KG prepared the original draft manuscript. All authors reviewed and edited the manuscript. All three authors approved the final version of the manuscript.

Inclusion Criteria:

- Participants must be NHS healthcare staff (including bank staff) and be currently working within the critical care environment.
- Participants must be English speaking
- The age range for participation was 18-65 years, representing the age range of staff members working within the intensive care environment.

Exclusion Criteria:

- Agency staff, NHS staff not working within critical care, patients, service users and the general public were excluded from participating in this study.

Recruitment ceased when thematic saturation was achieved (2.2.2.2) (202, 203).

4.3.2. STUDY DESIGN

The study was designed as a mixed methods study, with the aim of obtaining quantitative data that would provide a measure of the environment (either safety climate or psychological safety), and qualitative data that would lead to an understanding of the reasons for how these environments manifested and the nature in which they did so.

To answer the first two research objectives in this study, a triangulation approach for data analysis was employed (2.1). It was intended that the interpretations and conclusions drawn when answering the research objectives would be based upon both qualitative and quantitative data. As such, the study was designed to obtain complementary data from two sources, providing several viewpoints on the same phenomena.

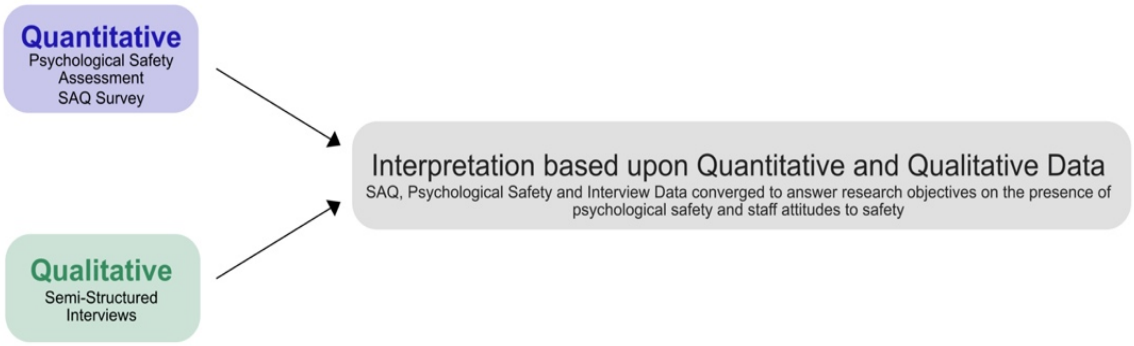


Figure 10. Intended plan for Triangulation of Data from Qualitative Interviews, the SAQ and Psychological Safety Assessment.

Data collection included a semi-structured qualitative interview that housed a quantitative assessment of psychological safety. In addition, a written quantitative safety assessment was completed. The triangulation of these data sources was designed to allow for an exploration into psychological safety, perceived stress, staff attitudes to safety, error and teamwork.

The third objective within this study was addressed using qualitative data alone, exploring critical care staff perceptions of how they were affected by factors relating to the workplace environment.

As per U.K. Research Governance guidance, studies involving NHS staff by virtue of their role do not require ethical approval. Health Research Authority approval was granted for this study (Reference: 19/HRA/0522) in addition to approval from Imperial College Healthcare NHS Trust and Imperial College's Joint Research Compliance Office (Reference: 18HH4812).

4.3.2.1. Qualitative Interviews

Qualitative interviews lasting approximately 45 - 60 minutes were planned. These took place in person in private rooms within the critical care unit the staff member worked and were scheduled for a time and date that was suitable for the participant.

The topic guide was informed by a thorough literature review on safety, stress and psychological safety (1.1.2, 1.1.4, 1.1.5), analytical themes generated within the evidence synthesis and the preliminary analysis of the FICM workforce survey (292). The topic guide can be viewed in Appendix 1.

The main themes to be covered within the interview included:

- An understanding of the organisational structure of the critical care unit and workplace environment.
- Participant views on teamwork within their workplace.
- An exploration of the participant's psychological safety.
- The manifestation of teamwork and safety within the critical care environment.

Qualitative interviews were intended to be iterative in nature, facilitating enquiry of new topics and themes related to the topic guide but not originally envisioned. Interviews were analysed in parallel with ongoing scheduled interviews (2.1.1.1.2). This allowed later interviews to expand on topics or themes (for example, elaborating upon specific barriers to psychological safety) that became apparent during earlier interviews.

Prior to commencement of the interview participants were given the opportunity to ask questions and provided written consent. Interviews were recorded and transcribed with all personal identifying information removed.

4.3.2.2. Assessment of Psychological Safety

Contained within the qualitative interviews was a validated assessment of psychological safety, as developed by Edmondson (26). Participants were asked about their agreement with 7 statements that conveyed information about the presence of an environment of psychological safety (rated agree, neutral or disagree). Thus, participants were able to elaborate on their choices as appropriate, generating both qualitative and quantitative data.

The 7 statements were as follows:

1. "If you make a mistake on this team, it is often held against you"
2. "Members of this team are able to bring up problems and tough issues"
3. "People on this team sometimes reject others for being different"
4. "It is safe to take a risk on this team"
5. "It is difficult to ask other members of this team for help"
6. "No one on this team would deliberately act in a way that undermines my efforts"

7. “Working with members of this team, my unique skills and talents are valued and utilised”

Each statement was analysed as a 3-part Likert Item and treated as categorical ordinal data (2.1.2). Median, mode and interquartile ranges were calculated for each item. Each Likert Item was scored between 1-3, with a value of 3 representing a climate of psychological safety. Items 1, 3 and 5 were reverse scored, as disagreement with the statement reflected higher psychological safety.

4.3.2.3. Safety Attitudes Questionnaire

Once the qualitative interviews were completed, participants were handed a paper version of the Safety Attitudes Questionnaire (SAQ; Appendix 2) to complete.

Safety cultures within healthcare organisations have been well evaluated using the SAQ (1.1.5.2). The SAQ requires participants to rate their agreement with 36 Likert Items (there is a longer 60 item version) along a 5-point scale (from strongly disagree through to strongly agree). Given the significant time burden on participants engaging in a 60-minute interview it was elected to use the short version of the questionnaire, as this provided enough targeted data to address the research objectives.

The caregiver attitude scales within the SAQ (1.1.5.2) mapped well to the research objectives – exploring stress, teamwork, error and safety, thereby justifying the use of this assessment within the research study.

Permission to use the SAQ was granted from the Centre for Healthcare Quality and Safety at the University of Texas.

Data from each Likert item were treated as categorical ordinal. Most items were scored from 1 to 5, with 5 being attributed to strongly agree. Seven items were reverse scored (2, 11, 20, 21, 22, 23 and 36).

For each Likert item, the median, mode and interquartile range were calculated in order provide a measure of the safety attitudes for each question. Values for each Likert item were displayed in a clustered bar chart according to the climate they corresponded to.

The Likert items contributing to each caregiver attitudes climate scale were combined to produce 6 Likert scales (120). The resulting Likert scale data were managed as continuous

intervals and as such values for mean and standard deviation were calculated for these data, to provide a numerical indication of the overall positive or negative orientation towards the subject.

4.3.2.4. Plan for Data Analysis

Qualitative data were analysed alongside ongoing interviews. This allowed the identification of themes, informed the iterative development of the topic guide and assisted with an assessment of thematic saturation (Chapter 2.2.3). The complete data set were analysed according to a thematic analysis technique.

10% of the transcripts were coded by a second researcher (CLV) to provide a measure of inter-rater reliability and minimise researcher bias, providing values for the kappa coefficient and percentage agreement. Qualitative data were analysed within NVivo R1 software.

Quantitative survey data were analysed within Microsoft Excel and SPSS, generating descriptive statistics.

4.3.2.5. Reflexivity

Throughout the study I was aware of my clinical background in Anaesthesia and Critical Care. This provided me with an in depth understanding of the environment to be studied. I was careful to minimise the influence of my own experiences of stress and perception of psychological safety. I repeatedly reflected on how my position and background may affect study design, data analysis and interpretation.

The study team had the following backgrounds and experience: CLV is a senior nurse educator in critical care, EM is a former NHS manager who is now an academic in organisational studies and SJB is a clinical academic and consultant in critical care.

At the outset of this study the team believed there would be a significant presence of stress, and a psychological impact on individuals working within critical care as a consequence of their environment. There were no preconceived ideas about the levels of psychological safety that would be present. During discussions about study findings, the team maintained a reflexive position to minimise the risk of the analysis and interpretation being affected by any presumptions.

4.4. RESULTS

Thirty participants across the 3 critical care units were recruited. All participants completed the qualitative interview, assessment of psychological safety and the SAQ. The interviews were all conducted in person and ranged between 21 and 65 minutes in duration (with an average length of 38 minutes).

The participant sample included 11 nurses, 3 physiotherapists and 16 doctors, encompassing all levels of seniority. The demographics of participants can be viewed in Table 9:

Table 9. Demographics of Participants

Professional Group	Seniority	Number of Participants
Nursing	Senior (Band 7 and above)	4
	Junior	7
Physiotherapy	Senior (Band 7 and above)	1
	Junior	2
Doctor	Senior (Consultant)	7
	Junior	9

Thematic saturation was achieved within the first 20 transcripts analysed, with only minor modifications made to the coding frameworks for each analysis after this point (293).

4.4.1. ANALYSIS STRATEGY

Given the sizeable amount of qualitative and quantitative data collected in this study, following the initial review of the data it was decided to divide the data into three analysis streams. This division was planned according to the three study research objectives.

To correctly divide and group the qualitative data according to the corresponding research objectives, the first step within the analysis was to review, code and organise the entire qualitative data set as a whole. The coding process allowed themes to be identified and subsequently analysed in three separate streams. The results of each analysis are described below, with overall discussion and conclusions from the study as a whole presented at the end of this chapter.

4.4.1.1. Presence of Psychological Safety

The presence of psychological safety in the participant group was addressed by analysing and triangulating the quantitative assessment within the interviews and coded data relating to psychological safety within the qualitative interview transcripts.[7]

The analysis initially focused upon the two research sub-objectives outlined at the start of this study. As the qualitative interviews progressed, new and prominent themes regarding psychological safety were noted, which informed the direction and focus of this analysis. A third objective regarding the potential negative consequences of a psychologically safe environment emerged as a consequence of the iterative interview process (2.1.1.1.1) and early review of the qualitative data.

4.4.1.1.1. Identifying an Environment of Psychological Safety

To address the first research sub-objective quantitative survey data on psychological safety were analysed. These data predominantly demonstrated that participants perceived their working environment to be psychologically safe. In particular, 28 (93%) felt confident that they could ask other members of the team for help, with the same number agreeing that no one in the team would deliberately undermine them. Four participants (13%) did not feel they were able to bring up problems, and 10 (33.3%) either disagreed or were ambivalent as to whether it was safe to take a risk on the team. Six participants (20%) felt that a mistake would be held against them in the future, and 7 (23%) either disagreed with the statement "working with members of this team my unique skills and talents are valued and utilised" or felt ambivalent about being appreciated by the team. These responses are displayed in a clustered bar chart in Figure 11.

---

[7] This analysis was published in BMJ Open as Open Access under a creative commons licence (CC BY-NC). All authors have given consent to use the data within this thesis.

293. Grailey K, Leon-Villapalos C, Murray E, Brett S. Exploring the factors that promote or diminish a psychologically safe environment: a qualitative interview study with critical care staff. BMJ open. 2021;11(8):e046699.

Contributor statement: KG, EM and SB conceptualised and designed this study. KG and SB were involved in recruitment of participants. KG was responsible for data collection and overall data analysis. CLV assisted with data analysis. All authors reviewed the data and coding discrepancies in line with qualitative research techniques.

KG prepared the original draft manuscript. All authors reviewed and edited the manuscript. All four authors approved the final version of the manuscript

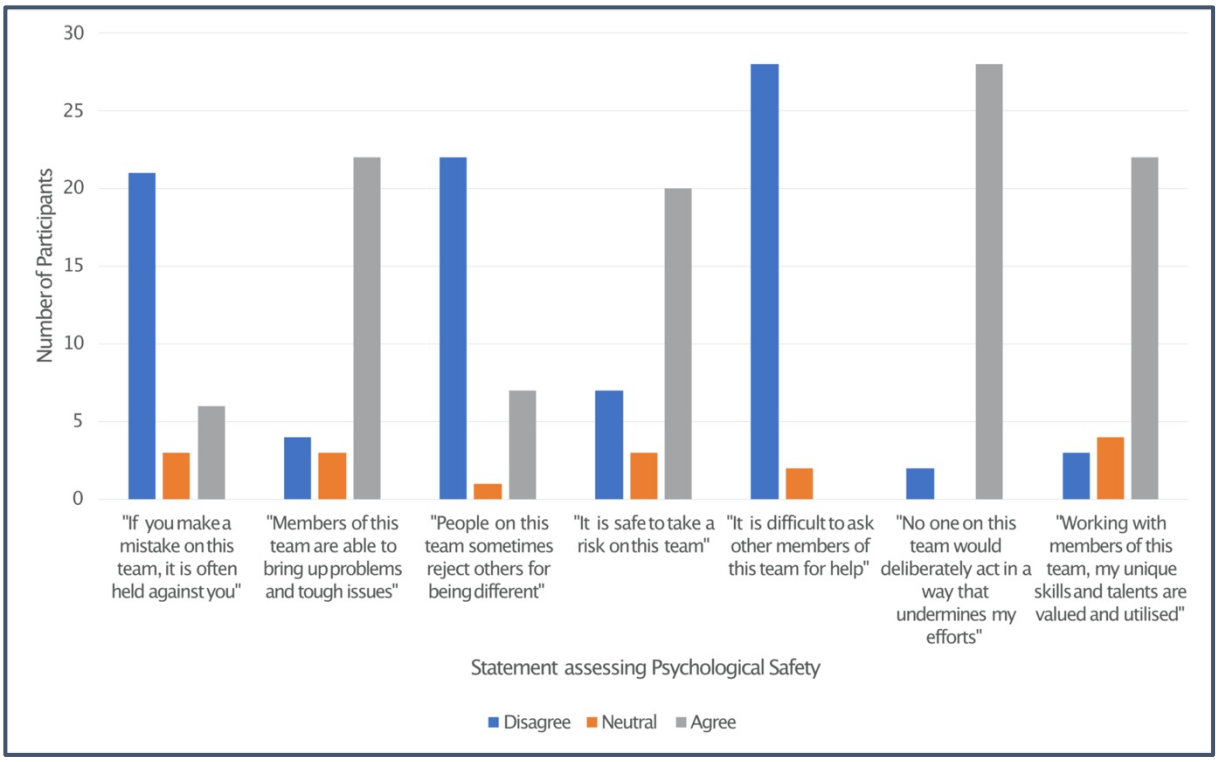


Figure 11. Agreement by Participants (n=30) with Validated Statements used to assess Psychological Safety. (Adapted from published figure (293))

The values for median, mode and interquartile range (IQR) were consistent with a climate of psychological safety being present, with a value of 3 for both median and mode, and a narrow IQR for all 7 items, demonstrating agreement between participants. These values are shown in Table 10.

Table 10. Mean, mode and interquartile ranges for psychological safety data

	MEDIAN	MODE	IQR
"If you make a mistake on this team, it is often held against you"	3	3	1
"Members of this team are able to bring up problems and tough issues"	3	3	0
"People on this team sometimes reject others for being different"	3	3	0.75
"It is safe to take a risk on this team"	3	3	1
"It is difficult to ask other members of this team for help"	3	3	0
"No one on this team would deliberately act in a way that undermines my efforts"	3	3	0
"Working with members of this team, my unique skills and talents are valued and utilised"	3	3	0

Qualitative data relating to psychological safety corroborated quantitative data. Data supported the presence of a psychologically safe environment, with participants in agreement that they were able to speak up, raise ideas, and engage in behaviours that allowed them to

be “their true selves” (25) without any fear of personal repercussions. Examples of supporting qualitative data are shown below:

> *“Hopefully we’ve created an environment where even the most junior nurse quickly realises that this is very much an open forum. And some of the things I say at the end of every visit to the bed space is, are you happy with the plan? Is there anything else you’d like us to see to? Summarise what we’ve all said.” Consultant, 0021*

> *“they allow us to voice our opinions” Junior Doctor, 0025*

> *“I think, actually, our culture is evolving quite a lot in healthcare and as a result, people do feel empowered to talk in certain scenarios, which is good” Junior Doctor, 0027*

The inter-rater reliability for the thematic analysis in psychological safety was good, with a high percentage agreement (>95%) across all themes. The kappa coefficient demonstrated excellent agreement (K>0.7) for eight of the themes and fair to good agreement (K=0.4–0.7) for three.

Demonstrating the presence of a psychologically safe environment through this data triangulation facilitated the ongoing analysis into the antecedents, manifestation and influence of this phenomenon.

4.4.1.1.2. Influence of Situational Context on Psychological Safety

Interview transcripts were further examined to address the second research sub-objective. A thematic analysis approach was used to understand and develop themes regarding the influence of situational context on psychological safety, thereby building on the concepts developed within the evidence synthesis. Once coding was complete and themes had been identified, a thematic framework was constructed. This was organised according to the level within the organisation that each theme was relevant to (individual, team or organisation), corresponding to frameworks frequently used to describe psychological safety within the literature. It was anticipated that this framework (Figure 12) would be helpful when designing interventions to improve psychological safety within the critical care workplace.

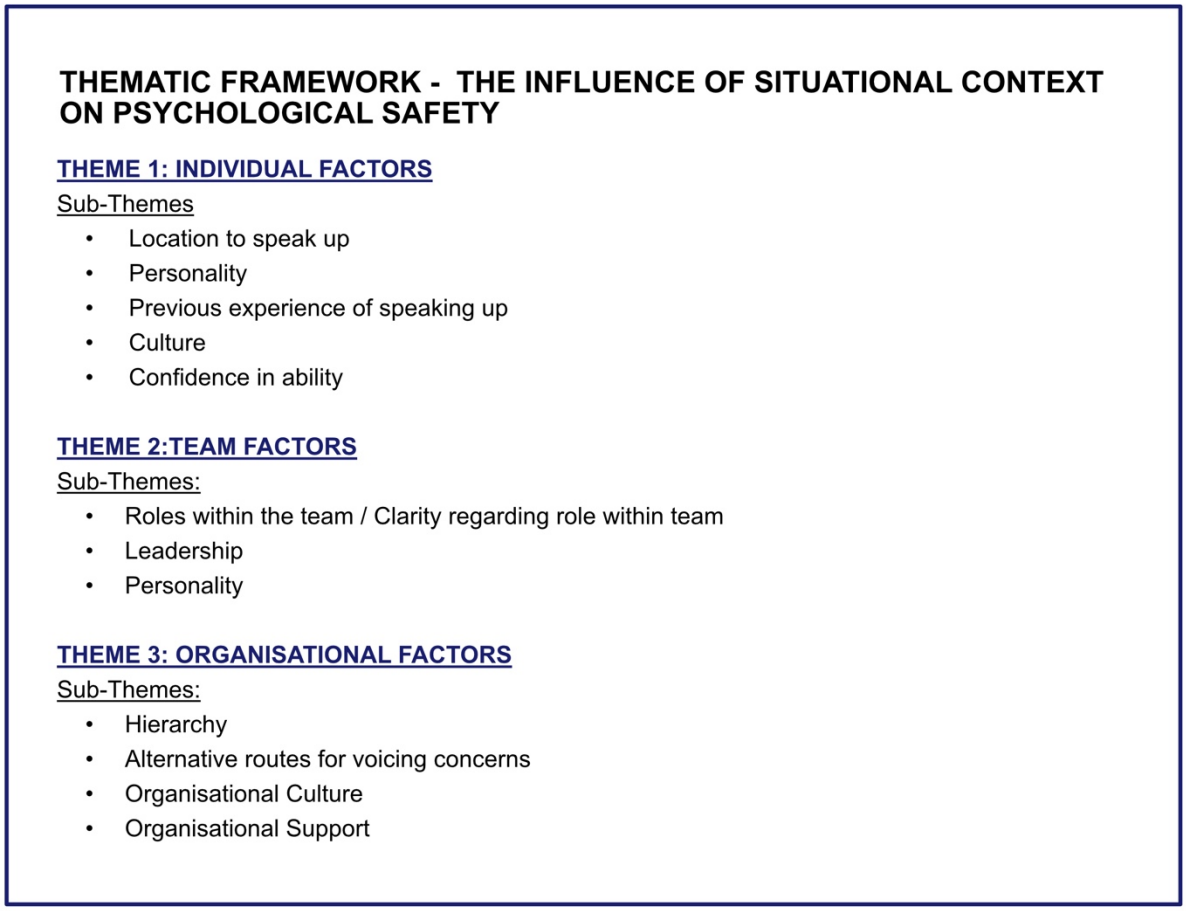


Figure 12. Thematic Framework relating to the Influence of Situational Context on Psychological Safety

At an individual level, contextual factors which influenced psychological safety included location to speak up (this was particularly relevant if the setting was during a ward round with a large number of attendees), previous experience of speaking up and an individual's confidence in their ability.

Other contextual factors at an individual level were the impact of their own "personality" (as *perceived* by the participant), and their culture (some participants felt that their ability to raise concerns was impeded by that fact they did not find it culturally acceptable to speak up against someone more senior) (293).

> *"it's always on a big ward round with 20 people, and sometimes you don't feel comfortable saying certain things in that environment." Junior Staff Nurse 0007*

> *"But I do think sometimes that people within the medical team might have different opinions and they don't always speak up, and that might be personality based or confidence based." Senior Physiotherapist 0017*

> *"They [nursing staff] were very capable, but they were absolutely unable to say anything at all to the doctors because culturally, that just wasn't acceptable" Senior Doctor 0024*

At a team level, three areas of situational context emerged which were identified as affecting an individual's psychological safety. This included the level of clarity regarding allocated roles within the team (this was a particularly predominant theme when discussing psychological safety within an emergency clinical scenario), the presence of clear leadership and the personality of other team members (again, a term used by participants in the normal conversational sense) (293).

> *"Everyone was talking to each other. Everyone kind of managed their roles. Because you all work together so much and because it's something that relatively frequently happens, you know what your role is and you jump into the role, speak to each other." Junior Doctor 0019*

> *"I really make a point of making sure that they [junior staff members] have a voice on my ward round" Senior Doctor 0023*

Situational context also had an influence at the organisational level. Environments with a stricter hierarchy were reported as creating a less psychologically safe space. The context of the organisational culture was also important (for example, if speaking up was encouraged within the organisation, as opposed to just within individual teams). This was reflected when looking at the context of organisational support. The provision of alternative routes to speak up as provided by the structure within the organisation also proved to be a prominent subtheme – utilising alternative routes was a method used by many individuals to navigate around some perceived barriers. These alternative routes included having more than one available individual working in senior roles, therefore providing multiple opportunities for a participant to voice their concerns (293).

> *"if you didn't have that hierarchy, the even within the nursing world the junior nurses or junior doctors may feel, they may find it easier to speak up and be empowered to speak up, but I think everything's a balance" Junior Doctor 0008*

> *"So, I think spreading a culture of comfort and a culture of freedom and trying to make everyone feel that they are okay, it is okay to speak and say, I don't like. Or I don't understand this. That is definitely safer for patients." Senior Doctor 0029*

> *"So, a senior nurse will just talk to you directly, whereas a very, very junior nurse just doesn't have the balls to do that. They think "oh my god, I can't challenge the consultant". So, they'll either keep quiet, or they'll talk to a colleague, or the best thing for them to do is go to the senior nurse." Senior Doctor 0023*

Further supporting qualitative data for this framework can be viewed in Appendix 3.

Once the thematic analysis was complete, qualitative data were further analysed considering how these contextual factors would impact a climate of psychological safety. The model created in the evidence synthesis (3.4.3.1) was developed and modified to demonstrate how key factors identified within this analysis of critical care staff can influence the context of each clinical situation at each level within the organisation. The model highlights how these factors can thereby impact a climate of psychological safety (Figure 13).

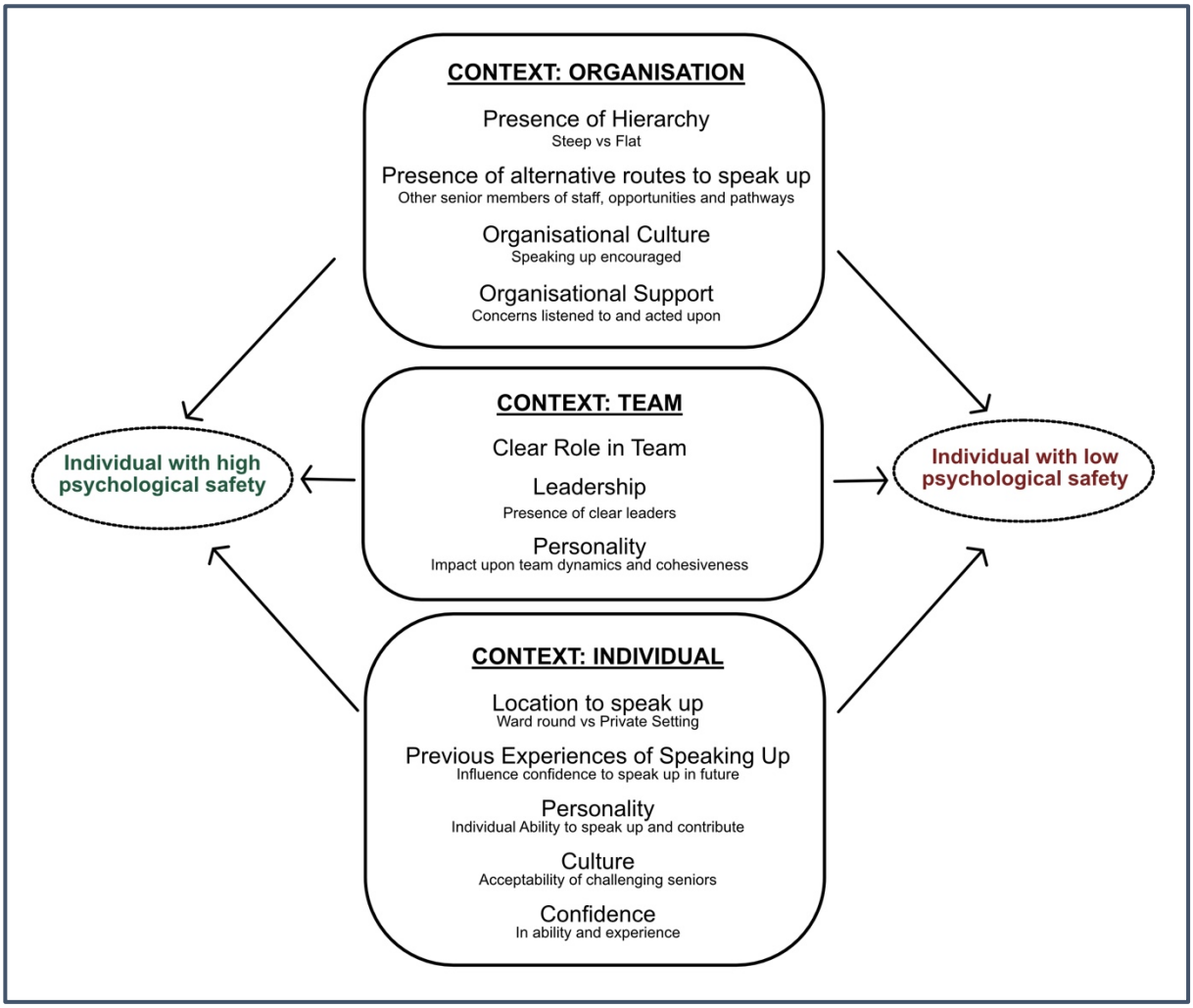


Figure 13. Areas identified within the Thematic Analysis in which Situational Context influenced Psychological Safety within the Critical Care Environment. (Adapted from Figure in published manuscript (293))

4.4.1.1.3. Negative Consequence of Psychological Safety

This third research sub-objective was not anticipated at the outset of the study but emerged as a key area during the iterative process of data collection and analysis. As the interviews

progressed it became evident that the possible "negative" consequences of a psychologically safe environment were being frequently discussed by participants. Consequently, as the interviews progressed the topic guide evolved to ask participants directly if they had observed or experienced any negative consequences of psychological safety.

Whilst all participants were in agreement that the presence of psychological safety was important and generally beneficial within the critical care environment, there was an awareness from both those "listening to concerns" (generally those in more senior or leadership positions) and those "taking risks" (individuals speaking up, raising concerns or ideas) of the potential for negative consequences. This did not influence the feeling of being "safe to take a risk on the team" itself as these consequences did not lead to an individual feeling unsafe or at risk of personal retribution. In essence, these negative consequences would not manifest *without* a psychologically safe environment – it facilitates their existence.

A thematic framework housing three key themes was constructed. This reflected participants descriptions of situations where negative consequences of psychological safety might arise. The three themes were as follows: the impact on a clinical decision maker's "bandwidth" (defined as "*the energy or mental capacity to deal with a situation"* (294)), that the context of the clinical situation could lead to negative consequences when all individuals were psychologically safe, and that a psychologically safe environment facilitated motivations to speak up that were not always regarded as beneficial to the organisation (293).

This framework is displayed below (Figure 14):

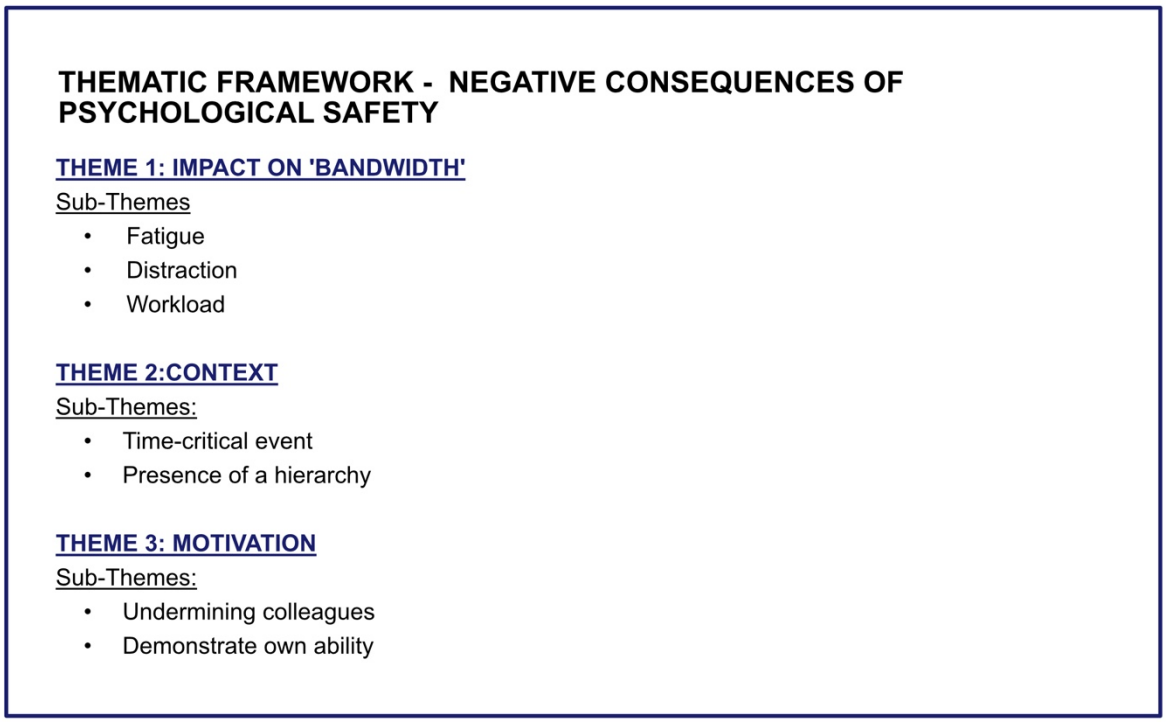


Figure 14. Thematic Framework constructed from Data relating to Negative Consequences of Psychological Safety

Impact on "Bandwidth"

The concept of "Bandwidth" being affected by a psychologically safe environment was discussed by many participants. It appeared consistent across the interviews that the person who was responsible for clinical decision making (this would vary depending upon the clinical scenario, staffing and shift times) was at risk of having an overloaded "bandwidth" as a result of multiple concerns or ideas being raised within a relatively short window of time. A frequent example of this was multiple questions being raised during a ward round, with interruptions from others, not directly related to the task in hand.

This impact on a clinical decision makers "bandwidth" had three potential consequences. Firstly, the decision maker became at risk of fatigue as a result of managing multiple concerns and ideas – potentially leading to poorer clinical decision making. Secondly, an increase in the volume of concerns raised causing the decision maker to become distracted – risking missing important clinical information or making errors. Thirdly, participants raised the issue that the clinical workload is often significant – and by having to manage a large number of concerns or "bright ideas" being raised, this could subsequently reduce the time available for clinical

care (for example, by making the ward round longer in duration and thereby limiting time available for clinical tasks) (293).

> *"This is particularly true during handover, for example. You know? If you have four people at the same time talking about one new admission. You have no idea what is relevant, and it is just too much information to process" Senior Doctor 0028*

> *"Sometimes maybe we might interrupt them [the medical team] too much. Say if a doctor's desk we might ask them lots of different things rather than keeping it to the salient" Senior Staff Nurse 0009*

> *"it might make things take longer and the ward rounds are already very lengthy." Junior Doctor 0032*

Context

The context of the clinical situation was also relevant when considering the manifestation of negative consequences of psychological safety. In a clinical situation where appropriate actions were time-critical (generally emergency clinical scenarios), raising concerns that were not essential or immediately relevant was perceived as being negative and posed a risk of distracting the decision maker. It was also highlighted that some individuals (this was an observation of other staff members behaviour as reported by participants) would voice concerns to multiple senior staff members – behaviour seen as having the potential to cause confusion and error.

An environment perceived to have a flatter hierarchy was deemed to facilitate some of the negative aspects of psychological safety. This more level structure allowed multiple voices and opinions to be heard, risking confusion and a distortion of the original clinical plan (293).

> *"It might not be a good idea in a really stressed situation when everyone's running around trying to do the best they can for a patient" Junior Doctor 0019*

> *"if you have a loosening of the structure or the hierarchy you can have the nurse go to different people and that can actually distort the information a lot" Junior Doctor 0005*

Motivation to speak up

The perception of being in a psychologically safe environment was described as providing individuals with the assurance and confidence to speak up and be an active member of the

team, even if their motivations were not to promote good clinical care or improve the organisation.

Some participants observed that in others, this motivation may not have been driven by patient safety, but either to deliberately criticise or to undermine those in a more senior position. This also manifested as individuals raising issues to more than one person, until they received the answer or solution they desired. In addition, it was also felt by participants that some individuals utilise this psychologically safe environment in order to speak up and be "seen" to be engaged and involved (rather than to improve patient care), knowing they can do this without fear of personal repercussion. Interestingly, this behaviour would not manifest without an environment of psychological safety, as it provides the safety for these actions to take place (293).

> *"You're actually bypassing the nurse in charge. And then at the end of the day, the nurse in charge doesn't know anything about what's been discussed with you and the consultant." Junior Staff Nurse 0012*

> *"Often those things cannot necessarily be constructive, because they've not necessarily grasped the scenario or they don't have a knowledge base". Junior Doctor 0027*

These themes and subthemes regarding the possible negative consequences to psychological safety are outlined below, with supporting quotations for each sub-theme (Figure 15).

Further supporting qualitative data organised within the thematic framework can be viewed in Appendix 4.

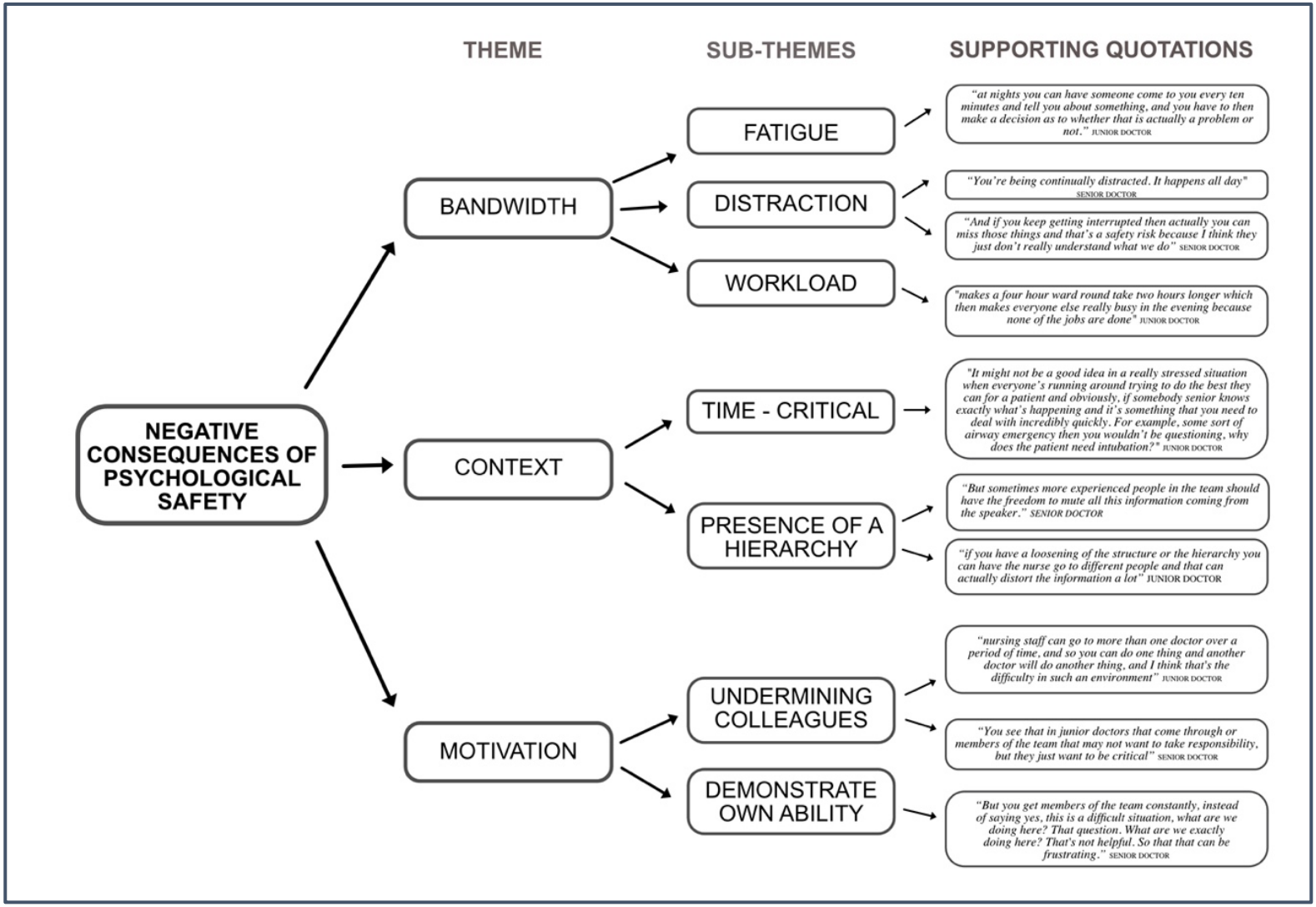


Figure 15. Supporting Qualitative Data exploring the Potential Negative Consequences of a Psychologically Safe Environment (293)

4.4.1.2. The Safety Attitudes of the MDT in Critical Care

The second analysis stream within this study addressed the second research objective and explored the safety attitudes of the multidisciplinary team in the critical care setting. The analysis had two components – a quantitative assessment of safety attitudes within the critical care environment and an exploration of qualitative data describing staff attitudes to safety.

Data were triangulated to provide an increased understanding of how a 'safe' environment manifested, and the factors that contributed to or undermined this.

4.4.1.2.1. Results

4.4.1.2.1.1. SAQ

SAQ data generally favoured the presence of a safe workplace environment, demonstrating the existence of a strong safety climate and positive participant attitudes towards safety.

Median values for each of the 36 Likert items demonstrated that participants generally perceived their working environment to be safe. The interquartile ranges for each item were narrow (typically 1), showing concordance across participant scores and indicating that participant views within the group were generally aligned.

Table 11 demonstrates the median, mode and interquartile range for each Likert item.

Table 11. Median, Mode and Interquartile Range (IQR) for all 36 Likert Items. Reverse scored items are shown in italics (a low score for these items corresponds to a safer climate).

	MEDIAN	IQR	MODE
TEAMWORK CLIMATE			
1. Nurse input is well received in this clinical area.	5	1	5
2. In this clinical area, it is difficult to speak up if I perceive a problem with patient care.	2	2	1
3. Disagreements in this clinical area are resolved appropriately (i.e., not who is right, but what is best for the patient).	4	1	4
4. I have the support I need from other personnel to care for patients.	5	1	5
5. It is easy for personnel here to ask questions when there is something that they do not understand.	5	0.75	5
6. The physicians and nurses here work together as a well-coordinated team.	5	1	5
SAFETY CLIMATE			
7. I would feel safe being treated here as a patient.	5	1	5
8. Medical errors are handled appropriately in this clinical area.	4	1	5

9. I know the proper channels to direct questions regarding patient safety in this clinical area.	5	1	5
10. I receive appropriate feedback about my performance.	4	2	4
11. In this clinical area, it is difficult to discuss errors.	2	2	2
12. I am encouraged by my colleagues to report any patient safety concerns I may have.	4	1	4
13. The culture in this clinical area makes it easy to learn from the errors of others.	4	2	4
14. My suggestions about safety would be acted upon if I expressed them to management. *	4	1	4
JOB SATISFACTION			
15. I like my job.	5	1	5
16. Working here is like being part of a large family.	4	1	5
17. This is a good place to work.	5	1	5
18. I am proud to work in this clinical area.	5	1	5
19. Morale in this clinical area is high.	4	1.75	4
STRESS RECOGNITION			
20. When my workload becomes excessive, my performance is impaired.	4	1	4
21. I am less effective at work when fatigued.	5	1	5
22. I am more likely to make errors in tense or hostile situations.	4	2	5
23. Fatigue impairs my performance during emergency situations (e.g., emergency resuscitation, seizure).	4	3	4
PERCEPTION OF MANAGEMENT (HOSPITAL)			
24. Management supports my daily efforts:	4	1	4
25. Management doesn't knowingly compromise pt safety:	4	2	5
26. Management is doing a good job:	4	1	4
27. Problem personnel are dealt with constructively by our:	4	1	4
28. I get adequate, timely info about events that might affect my work, from:	4	2	4
WORKING CONDITIONS			
29. The levels of staffing in this clinical area are sufficient to handle the number of patients.	2	2	2
30. This hospital does a good job of training new personnel.	4	2	4
31. All the necessary information for diagnostic and therapeutic decisions is routinely available to me.	4	1	4
32. Trainees in my discipline are adequately supervised.	4.5	1	5
33. I experience good collaboration with nurses in this clinical area. *	5		5
34. I experience good collaboration with staff physicians in this clinical area. *	5	1	5
35. I experience good collaboration with pharmacists in this clinical area. *	5	0	5
*36. Communication breakdowns that lead to delays in delivery of care are common. **	3	3	1

*Likert item not incorporated into a safety climate.

Thirty-one Likert items contributed to the 6 caregiver attitude climates and were combined to create 6 Likert Scales. Mean and standard deviation calculations for these Likert Scales are shown in Table 12.

Table 12. Mean and Standard Deviation Scores for each Caregiver Attitude Climate.

Caregiver Attitude Climate	Mean	Standard Deviation
Teamwork Climate	4.32	3.91
Safety Climate	4.02	4.09
Job Satisfaction	4.25	3.83
Stress Recognition	1.94	1.78
Perception of Management	3.75	3.39
Working Conditions	3.62	3.33

For "Teamwork Climate", responses were in favour of a climate where teamwork was viewed positively – with participants agreeing that they had adequate support and worked well together. Twenty-seven participants agreed (either slightly or strongly) that disagreements were resolved appropriately, with 25 agreeing that nursing input was well received.

The Likert Scale for "Safety Climate" included 7 Likert Items, (7-13) and again favoured a perception of a safe environment. There was less concordance between participants for items 10 ("I receive appropriate feedback about my performance") and 11 ("In this clinical area it is difficult to discuss errors"), both having IQR's of 2.

Items within the "Job Satisfaction Climate" again favoured a positive opinion for safety, although there was a larger spread of responses for item 19 ("Morale in this clinical area is high") than seen in the previous two climates. Reassuringly, for item 18 ("I am proud to work in this clinical area"), responses predominated towards a positive view, with 20/30 (66%) participants strongly agreeing with this statement.

Participants' answers were less favourable for the "Stress Recognition Climate". These items are reverse scored, therefore strongly disagreeing with the statement would allude to a positive view of safety culture. For all 4 items, the results favoured a negative view, with most individuals agreeing that they struggled with higher workloads and fatigue and were more likely to make mistakes in challenging conditions.

“Perception of Management” is the fifth caregiver attitude climate assessed within the SAQ and for the purposes of this study individuals completed their perception of hospital management (rather than unit management). This was chosen as no participants held roles in hospital management, so this would therefore reduce the risk of bias (for example, some nurses within the study were unit managers, which would likely have influenced their response). There was predominant agreement (either agree slightly or agree strongly) with all five stems, but a slightly larger spread across the five responses than seen in other Likert Scales. There was also a lower number of participants selecting strongly agree than was seen in the other Likert Scales. The IQR remained 1 however for all Likert items except for Item 25 “Management doesn’t knowingly compromise patient safety”, which had a IQR of 2. The means score for this scale was 3.75, which is slightly lower than that seen for teamwork or safety climate (4.32 and 4.02 respectively).

The final Likert Scale enquired about participants perception of working conditions and again there was less “strong agreement” with any of the four items than seen in the safety or teamwork climates. Notably, 16/30 participants selected disagree / strongly disagree for item 29 “the levels of staffing in this clinical area are sufficient to handle the number of patients”. Positively, 15/30 participants agreed strongly with item 32 “trainees in my discipline are adequately supervised”.

Clustered Bar charts for the 6 caregiver attitude climates are shown in Figure 16.

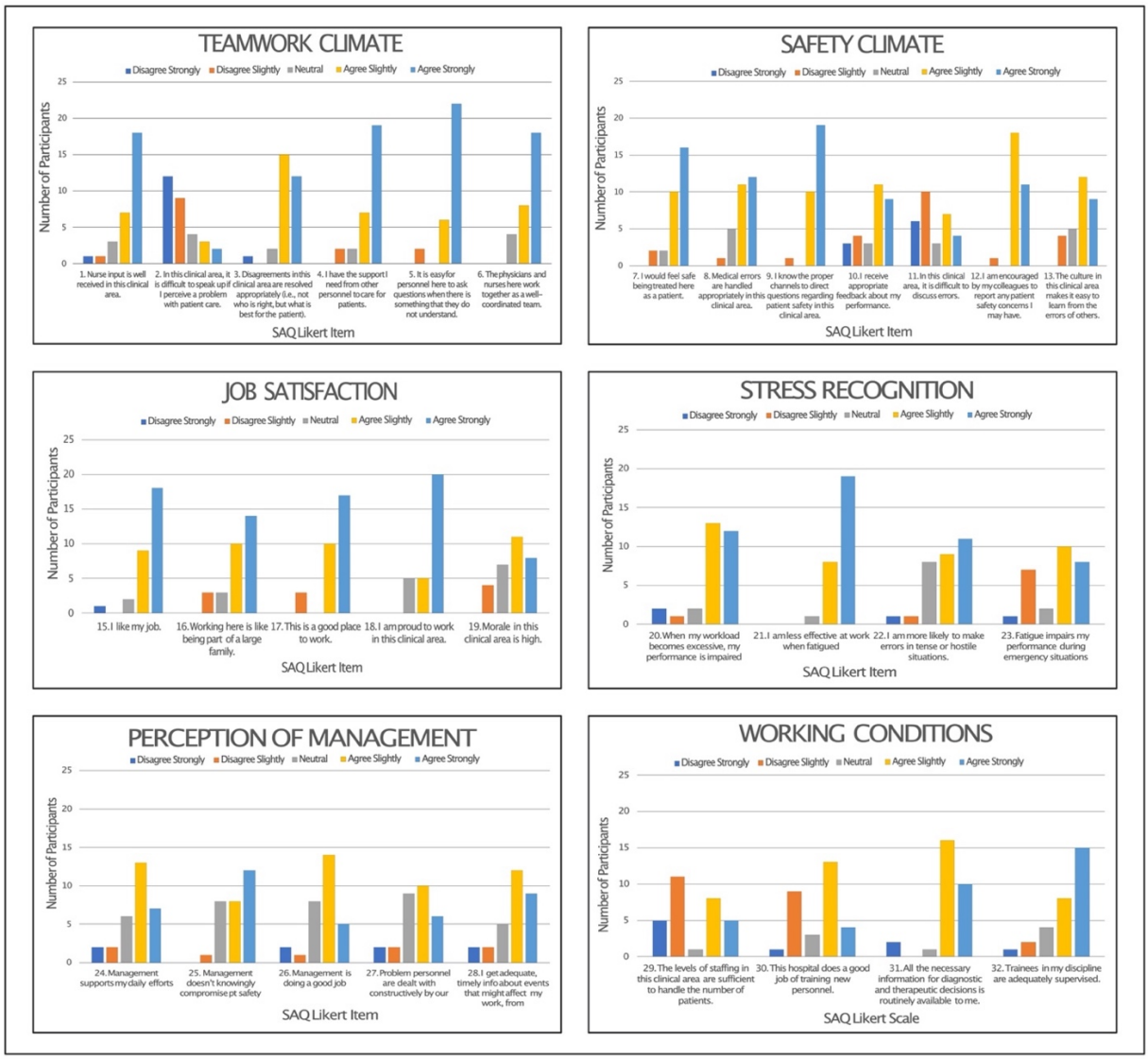


Figure 16. Results for the Six Likert Scales assessing Caregiver Attitude Climates within the SAQ.

Five Likert Items within the SAQ were identified as reflecting aspects of psychological safety within the critical care environment. These were:

- Item 2: "In this clinical area it is difficult to speak up if I perceive a problem with patient care"
- Item 5: "It is easy for personnel here to ask questions when there is something they do not understand"
- Item 9: "I know the proper channels to direct questions regarding patient safety in this clinical area"
- Item 12: "I am encouraged by my colleagues to report any patient safety concerns I may have"

- Item 14: “My suggestions about safety would be acted upon if I expressed them to management”

The responses to these Likert items were concordant with the findings in the first analysis stream, that a psychologically safe environment was present. Twenty-one (70%) participants disagreed that it is difficult to speak up if a problem with patient care is perceived. Twenty-eight (93.3%) strongly or slightly agreed that it was easy to ask questions about a topic they didn’t understand, with 29 participants (96.6%) stating they were aware of the channels in place to raise concerns about patient safety. The majority (29/30, 96.6%) either agreed / strongly agreed that their colleagues provided an encouraging environment within which to raise patient safety concerns. However, this leaves almost one third of participants who do not perceive speaking up to be an easy task. It was also concerning that a large number of participants (14/30) only “agreed slightly” that management would act upon patient safety concerns, with 9 being “neutral” and 3 “disagreeing slightly”. The responses for these 5 domains of the SAQ can be seen displayed in a clustered bar chart in Figure 17.

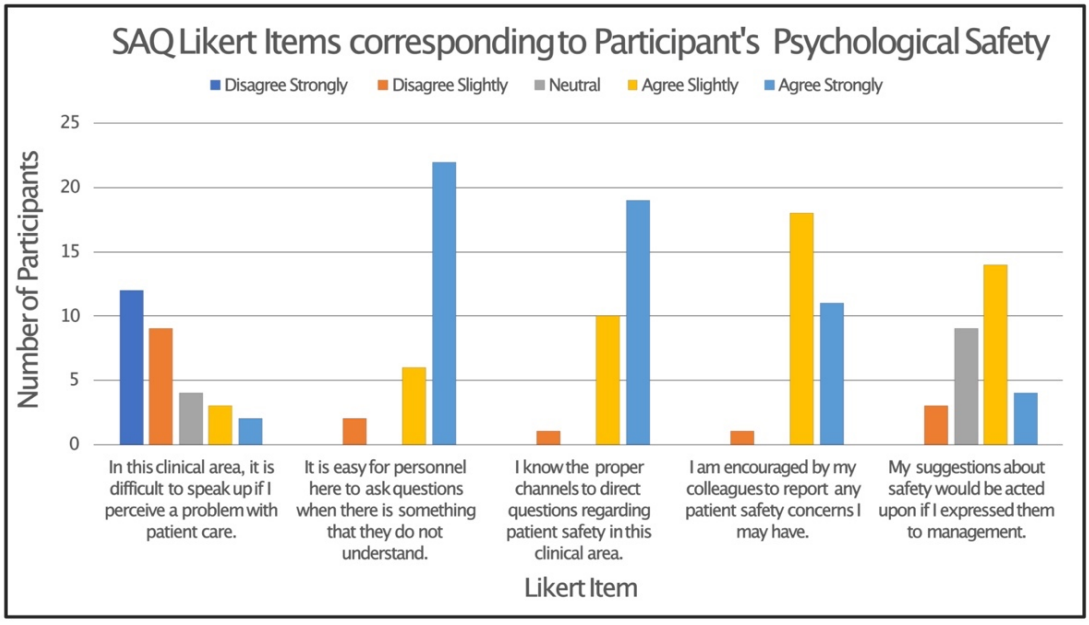


Figure 17. Clustered bar chart demonstrating responses to Likert Items consistent with psychological safety.

4.4.1.2.1.2. Thematic Analysis

Qualitative data relating to participant views on safety were re-reviewed, coded and organised into themes.

The inter-rater reliability for this analysis on data relating to safety was reassuring, with a high percentage agreement (>98%) across all themes, and the kappa coefficient demonstrating excellent agreement (K>0.7) for seven of the themes.

This analysis highlighted several factors that were related to the creation or perception of a safe working environment. In addition, there was a wealth of data exploring experiences of feeling "unsafe", and the management of errors. A thematic framework was constructed encompassing four key themes: "The presence of a safe environment", "Error reporting", "Teamwork" and "Stress" (Figure 18).

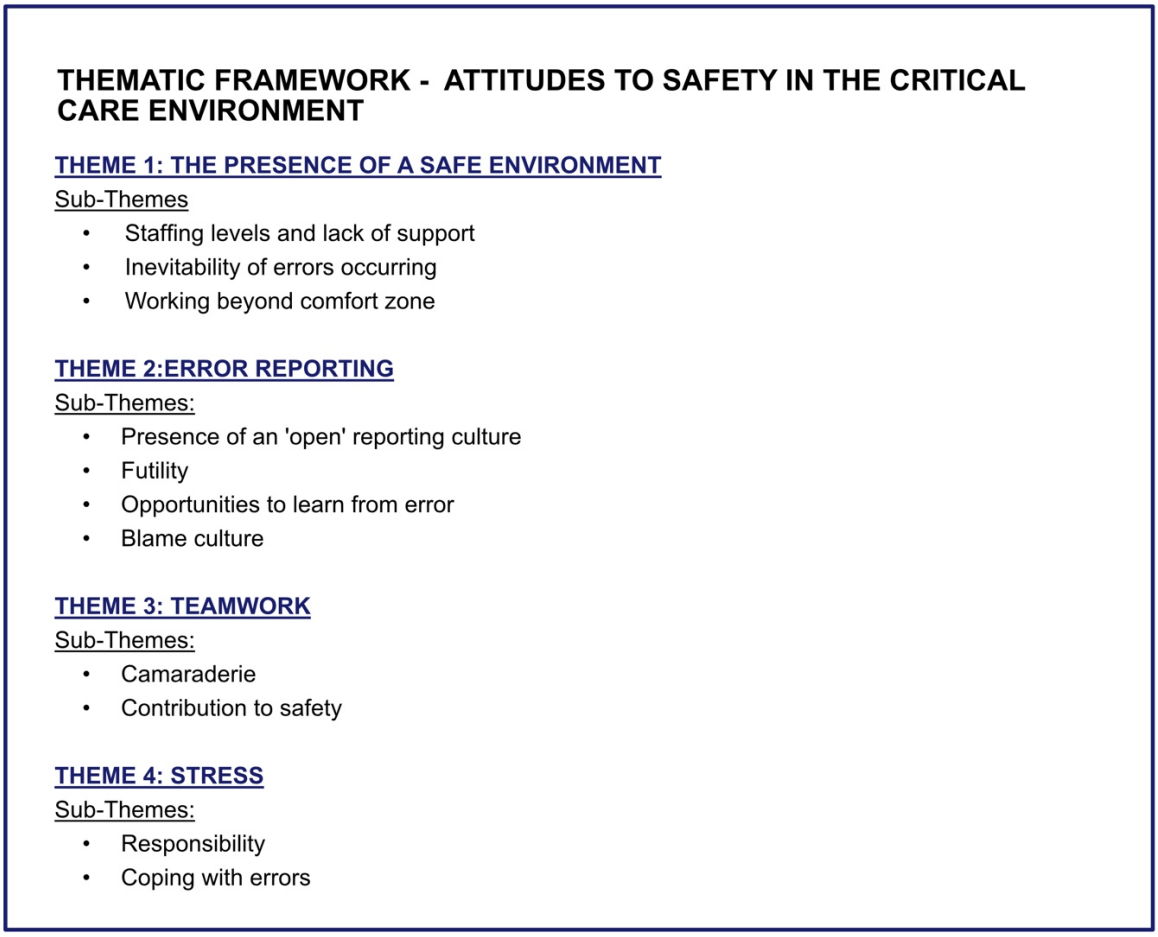


Figure 18. Thematic framework demonstrating themes regarding staff attitudes to safety.

The Presence of a Safe Environment

Many participants correlated a safe environment with the presence of adequate staffing. Consequently, understaffing or inadequately skilled staff was frequently reported as causing stress and reducing patient safety.

> *"Sometimes I feel like it was unsafe. Most of the time because we have not enough staff, so you have in a lot of places, thinking about many things, and yes, mistakes can happen." Staff Nurse, 0033*

Many participants reflected upon the inevitability of errors occurring. This perception was linked to factors explored in other subthemes – for example that working under constant stress would eventually lead to error. Participants described scenarios where issues such as high workload created an environment where errors were more likely to occur.

> *"I mean, you know, a system as a whole is always going to have something isn't especially if it's busy and stretched and things. But I mean equally I guess complacency is also a risk. So, I think it's probably inevitable isn't" Junior Doctor 0032*

Being required to operate beyond an individual's "comfort zone" was a consistent theme within the data. The aetiology of this feeling was multi-factorial – exacerbated by an overwhelming workload, lack of visible or accessible senior support and having appropriate and adequate training. A key contributor was the requirement to fill roles or complete tasks that were not part of a participant's original job description. These roles included complex clinical tasks and different professional responsibilities, such as managerial tasks. The opposite perception was also present within the data (although to a smaller extent) – with some participants highlighting that good support prevented them from feeling "out of their depth".

> *"looking back now, I think I was doing a lot of things that were probably out of my depth." Junior Doctor 0027*

> *"But we've had to step up into that role. And there is a lot of things that that is beyond me, however there is no one there, so I've had to do these things" Senior Physiotherapist 0020*

> *"There's not many situations where I felt like I'm out of my depth, and if there are, I've always felt really well supported" Senior Physiotherapist 0020*

Error Reporting

All three critical care units included in this study were described as having an open culture with respect to error reporting. Whilst this was viewed proudly and positively – generally by those in more senior positions, detrimental aspects were also described. These reflected a perception that the open culture led to the generation of high volumes of error reports. This minimised feedback and reduced the time available to investigate higher risk events.

> *"we wanted to foster a positive culture around it, where people weren't afraid to complete these incident forms, because we don't see it as a culture of blame, we see it as what is the problem, what were the circumstances around that problem" Senior Sister, 0022*

> *"But I don't think you'd fear the consequences because everyone on the team was so supportive and they would have helped you to deal with it" Junior Doctor, 0019*

Negative attitudes associated with error reporting frequently reflected a sense of futility – either due to a lack of feedback or a feeling that nothing would change. Participants also reported that often those receiving error reports were not in a position or able to action change. These attitudes appeared to lead to feelings of frustration and reduced motivation to engage in the process of error reporting.

> *"bigger, more important things that they need to deal with and we just have to live with it and carry on." Consultant, 0021*

A related subtheme to the perceived futility of error reporting arose from discussions regarding the opportunity to learn from errors. The views on this topic were heterogenous, with some participants suggesting error reporting provided a great opportunity to learn, with others feeling that learning did not occur as often as it should.

> *"Whether we then learn enough to not do it again, I doubt as well though" Junior Doctor, 0004*

> *"Because we're not a unit that does make a lot of mistakes, and I think that's why when there is ones, we're really sad and we do learn from it" Staff Nurse, 0007*

The presence of a blame culture was highlighted and discussed by several participants. Again these viewpoints were heterogenous – some participants described a prominent blame culture, where they risked reprisal for reporting errors, whilst others disputed its existence. It

was evident that fear of retribution had some influence on participant attitudes to safety, leading to an unwillingness to report errors when they occurred.

> *"There are consequences from it and so I think that would discourage it" Consultant 0013*

> *"I think the work environment is a no-blame environment, just generally. If I grade it, it is a no-blame environment" Consultant 0029*

Teamwork

Participants frequently discussed the links between teamwork and their perceptions of a safe working environment.

A sense of camaraderie was described within well-functioning teams. This appeared to have a positive benefit on both how safe participants felt and how safe they perceived the service to be for patients. Data illustrated the benefits of a well-staffed team, the presence of experienced senior support and team members understanding and respecting each other's roles. Participants reported poor relationships with those outside of the immediate critical care environment. The combination of team members working together each day was described as being crucial in creating a safe environment – with some teams being more functional in this regard than others.

> *"Sometimes you see great things, where, like, the nurse in charge, the physio, the nutrition, the pharmacist, all take part in the ward round, or the handovers. And I think that is really helpful. And we save a lot of time. And it helps with communication" Consultant, 0028*

> *"We are constantly subjected to abuse and destructive criticism from referring teams" Consultant, 0024*

Good teamwork was related to the perception of a safe environment. This manifested as open communication and involving all team members in discussions regarding plans and potential safety issues.

> *"We are because we do a safety briefing twice a day which has been a good safety innovation I think" Consultant, 0026*

Stress

The presence of "stress" was a prominent theme within the data. This was explored in relation to perceptions of safety and the occurrence of errors. Increased responsibility held by participants was frequently implicated in causing stress but was often viewed as the price of progression to more senior positions. This links to the earlier subtheme of "working beyond comfort zone". Feeling responsible for an error was identified as causing significant amounts of stress for several participants.

> *"I know for a fact that once you progress, there's always responsibility. And then that's the price of it" Staff Nurse, 0012*

> *"I feel really bad. And I know now that I work in a no-blame culture. And I work in a supportive system. But I cannot help it when I do a mistake. I have some sleepless nights. And I have a significant amount of stress." Consultant, 0029*

The final subtheme describes how participants coped with errors. Many described psychological distress and frustration after learning they had made an error, even if no harm to patients had resulted. Again, the data relating to this topic was heterogeneous, with some participants stating that they would want to know about their errors in order to learn from them, thereby viewing the process more positively.

> *"It's crushing. Your sense of self-worth and value is totally built up or bundled with your... I feel absolutely crushed and a sense of hopelessness and worthlessness and self-doubt" Junior Doctor, 0018*

> *"I'm happy to be told when things are wrong, and I've learnt that over the years" Consultant, 0023*

Further supporting qualitative data for each of these themes and subthemes can be viewed in Appendix 5.

Many of the themes within this analysis contained heterogenous participant perceptions – illustrating that both positive and negative attitudes to safety existed within the same clinical environment. A schematic diagram illustrating the influence of these themes was created (Figure 19), demonstrating how they can be modified to create either a negative or positive safety climate. This schematic diagram can be used by those in leadership positions within the clinical environment to identify areas for change and promote a safety climate.

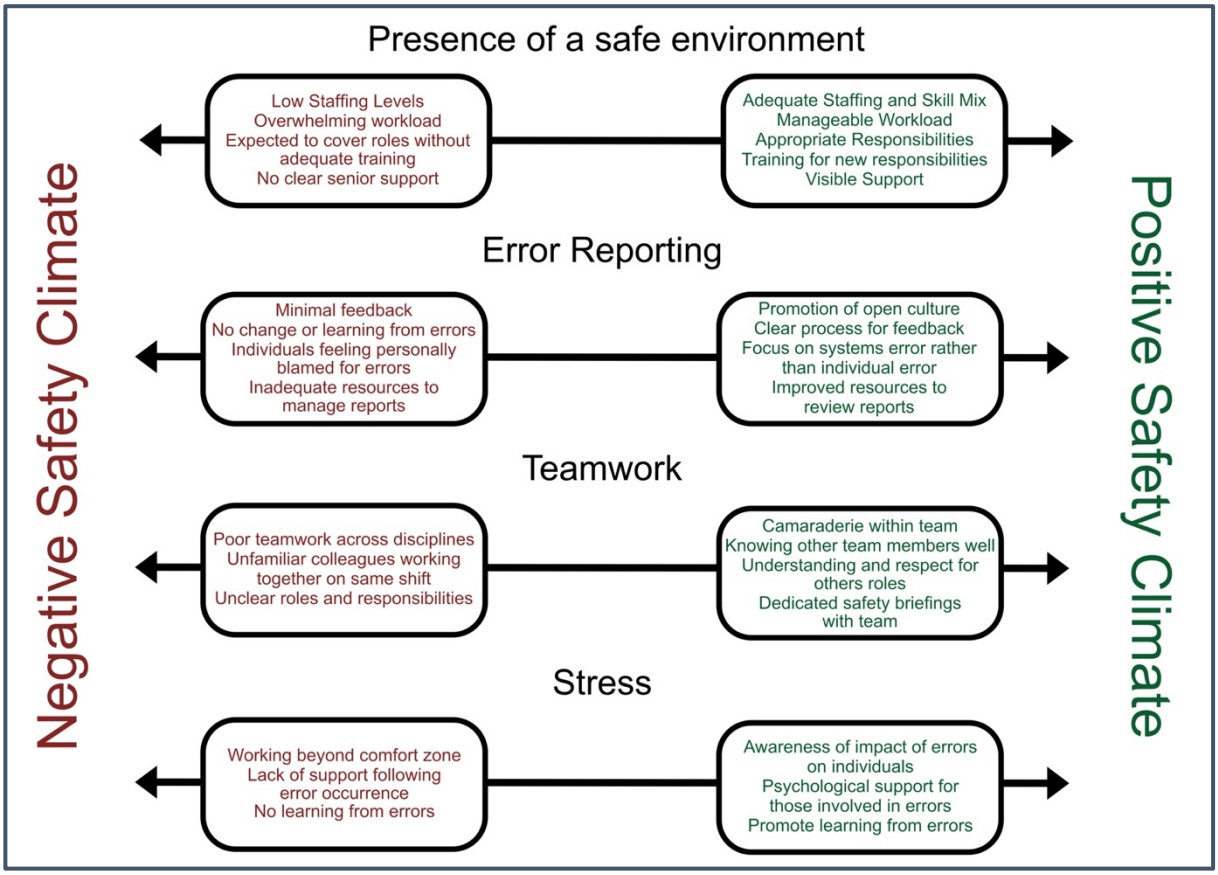


Figure 19. Schematic diagram highlighting the factors that influence a safety climate.

4.4.1.3. Impact of the Workplace Environment

A pre-defined aim of this Thesis and the third research objective in this study was to explore the impact of the workplace environment.

Within the qualitative transcripts, there were a wealth of data relating to workplace stresses (as defined by participants in a normal conversational sense), working relationships and how these were influenced by the working environment. These themes were identified, coded and extracted during the initial data review, and subsequently analysed in depth to specifically investigate the psychological impact of the working environment. Many of the factors identified within the thematic analysis demonstrated that stresses caused by the workplace environment led to increased job demands. Consequently, the themes identified were mapped to Karasek's Job Control Demand Model (72) (1.1.3.3), forming a framework for the data analysis.

4.4.1.3.1. Results of Thematic Analysis [8]

The thematic analysis identified several key themes relating to the working environment. These included staffing, physical factors (including unit layout and infrastructure), shift patterns, senior support and the availability of resources. These data were subsequently organised into a thematic framework according to the concepts within the Job Demand Control Model (52) – job demands and decision latitude (Figure 20). Additionally, data were reviewed for evidence of any impact on participant's psychological well-being.

There was heterogeneity within this framework – with some factors contributing to more than one theme (even if these themes were opposing in nature, such as low and high decision latitude). For example, the physical layout of the critical care unit (predominantly in terms of the impact of working in side rooms) had both positive and negative effects. This appeared to be related to the seniority and experience of the individual, with junior staff more likely to find this experience negative.

10% of transcripts were analysed by a second researcher (CLV) and a coding comparison query was performed within Nvivo (R1). For data relating to this analysis regarding the working environment, the percentage agreement was 99%, with Kappa coefficient values of >0.7 (indicating excellent agreement) for 10 subthemes.

[8] This analysis has been published in Human Factors in Healthcare as Open Access and under a creative commons licence (CC BY 4.0). All authors have given permission for the data to be presented and adapted for use in this thesis.

52. Grailey K, Leon-Villapalos C, Murray E, Brett SJ. The Psychological Impact of the Workplace Environment in Critical Care A Qualitative Exploration. Human Factors in Healthcare. 2021:100001.

Contributor Statement:

KG and SJB conceptualised and designed this study. KG and SJB were involved in recruitment of participants. KG was responsible for data collection and overall data analysis. CLV assisted with data analysis. All authors reviewed the data and coding discrepancies in line with qualitative research techniques. KG prepared the original draft manuscript. All authors reviewed and edited the manuscript. All four authors approved the final version of the manuscript.

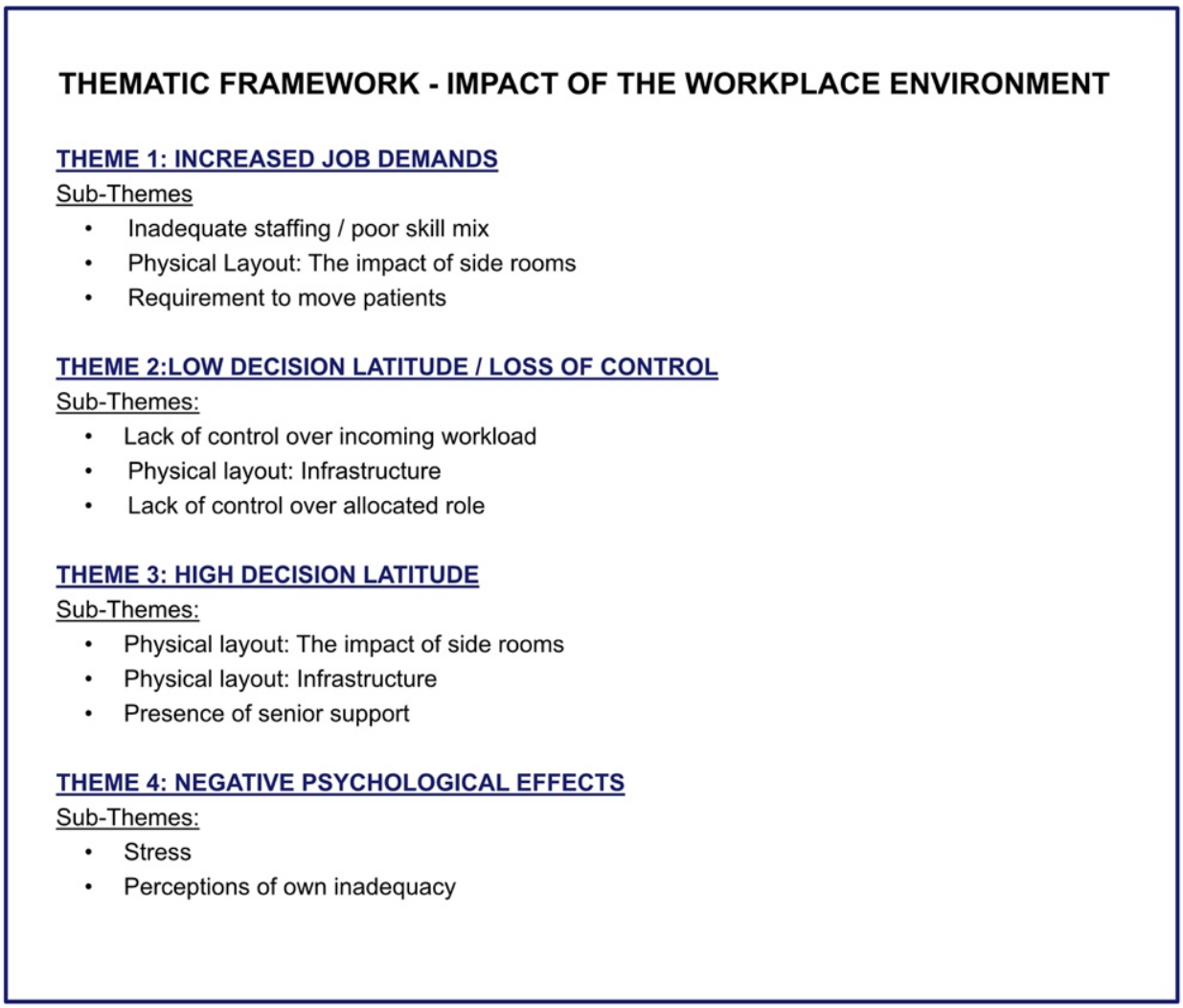


Figure 20. Thematic Framework constructed during the thematic analysis of qualitative data relating to the impact of the workplace environment.

Theme 1: Increased Job Demands

The data highlighted several areas where the working environment within the critical care units increased job demands for the individual. A lack of staffing, or a shortfall in the number of appropriately skilled staff / skill mix led to an increase in workload for the team leader, or more senior members of the team. This was generally as a consequence of supporting junior team members, covering staffing shortfalls and taking on an increased number of tasks themselves. Job demands also increased as a result of the physical availability of beds for new patients to be admitted into (52).

> *"I think when there are no beds or there are beds but there are not nurse sister staffed, those beds, I think that some of it depends on the seniority and the experience of the nurse in charge as to how difficult it becomes." Consultant Doctor, 0026*

"Especially when it was poorly staffed and a lot of the burden of work would be put on the anaesthetic trainee." Junior Doctor, 0006

The physical layout of the workplace impacted the demands placed upon the workforce. Patients in the critical care unit are nursed either within a multi-bedded bay or a side room. Both options had the potential to increase the workload for an individual. Those working in a multi-bed bay found their workload increased as a consequence of the requirements of other high acuity patients being nursed by colleagues. In single rooms, the fact that nurses were unable to leave a patient unattended could lead to challenges in getting help & assistance from those working outside (52).

"It really depends on how sick your patients are or your patient. If you're in a side room with a crashing level three, that is really hard if you run out of stock, and you're not allowed to leave a level three ever on their own, but if you've no drawing-off needles, you're pretty useless in that situation, and if the floor had been slammed and you're going, guys, help, it can be pretty hard." Senior Nurse, 0010

"Of course, if you are in the bay, even if you're patient is safe and it's stable, if the patient of your neighbour is quite sick, you're going to get the stress from it as well." Junior Nurse, 0014

Other causes of increased job demands included the requirement to move patients within the unit – this was to compensate for nursing ratios and was reported as being a significant burden on top of the existing workload. In addition, the frequent movement led to increased mental strain for doctors (52).

"It impacts in a number of ways. First of all, patients move around a lot because of that. So in order to optimise our staffing ratios, because you can't look after two patients at the same time in two separate side rooms, when we need to double patients which we do now in HD as well as in ICU, once people are no longer level three, assuming they can't come of a side room because they're not infected, etc. then we move them around a lot. So that impacts on everybody's workload, moving them around." Consultant Doctor, 0013

"It is a massive stress for the nursing staff. And I think they are exhausted by the end of the day. So, the nursing charge feels they spend more time moving, shipping patients around the unit to cohort them together than supporting nursing staff doing their nursing work." Senior Nurse, 0031

<u>Theme 2: Low Decision Latitude / Loss of Control</u>

The thematic analysis allowed the identification of areas where staff expressed feelings consistent with them no longer having control over the demands / situations they were facing.

One clear area was the lack of control over the volume or intensity of the incoming and established workload within the critical care unit but still having to manage this with inadequate staffing (52).

> *"We are constantly expected to achieve results without the resources" Consultant Doctor, 0024*

> *"I mean, sometimes it's physical beds but I found it much more frustrating when there was like two empty beds but they couldn't admit the patient downstairs because there was no nurse to take them. But I found that much more frustrating that when there are... that when the unit is full and they're full of sick patients and it's like, well, you know, it's going to happen." Junior Doctor, 0032*

Inadequate resources and problems with infra-structure (especially if issues were reported and not seen to be being fixed) were areas within the workplace environment that impacted staff. Whilst participants were able to control the jobs they were responsible for (such as reporting concerns) they reported little control over how these actions were responded to by other teams or those in positions of leadership. This described lack of control was subsequently related to feelings of stress and frustration (52).

> *"We've doors here that don't work. There's a door in an isolation room and you have to rip it open, and, honest to God, I was there all day yesterday, and my shoulder last night, trying to open that heavy door all day. There are a few things estates just don't fix. We had broken chairs for ages. Computer chairs, they would randomly just drop down when you were sitting on them." Staff Nurse, 0010*

Again, the movement of patients to cope with restricted resources was a factor in increased stress and confusion that medical team members had no control over. Individual staff members reported not being able to control their allocations for the shift – which could result in a mismatch between patient acuity, isolation of the staff member in the side room and feeling out of their depth with respect to their own ability. This allocation also extended to those working around them – with individuals also reporting being influenced by other staff members stress, particularly when working in the open bay (52).

> *"But when you are isolation rooms, for me, if you get a really busy patient in isolation, the problem is if you want to ask for help, you feel like you're isolated. It's difficult to ask for help." Junior Nurse, 0012*

> *"Yes. It is more stressful because you don't have… Because you are not allowed to let a patient alone, level three because safety". Staff Nurse, 0033*

Theme 3: High Decision Latitude

The analysis also yielded examples where the workplace environment had a positive impact on the staff members. This was often linked to the amount of control they had over their job demands.

When the nursing level was appropriately matched with the patient acuity this was a scenario with high control, irrespective of the job demands. The single room also provided the staff member a level of control over their working day and an ability to focus on their job with fewer interruptions from others (52).

> *"If you put a more senior person in there, they have a handle on what they're doing in the room and whether it's because of their seniority, interest, nosiness, whatever, they can find out what's going on outside as well." Nursing Manager, 0011*

> *I think a lot of our more senior nurses quite like having a quiet shift in a side room, even if the patients quite busy. A lot of them are quite experienced that they can deal with pretty much anything that's thrown at them and they're quite comfortable in their remit that, actually, they're very quick that if they think it's getting out of their comfort zone, they would escalate it very quickly." Senior Nurse, 0022*

The unit infrastructure was reported to have positive psychological benefits for staff. The presence of areas for staff to relax provided opportunities for team regrouping and bonding, allowing the maintenance of social relationships within the team (52).

> *"by maintaining our one staffroom, we've maintained the team. You could be working the complete opposite side of somebody but you go on break but it's nice to talk to someone, how's your day going? You're maintaining those relationships. I think that's helped us really well as a team." Senior Nurse, 0022*

Resources and staff availability led to a reduction in stress and negative feelings being reported by study participants. In particular, the accessibility of the medical teams provided reassurance and reduced stress & workload for their nursing colleagues (52).

> *"I feel like if I ever needed help, I could get it. If I was doing a procedure and something was going wrong, I could summon help quickly. It's a physically small area on a single floor. If you wanted help, you can say, help, please." Senior Nurse, 0018*

Theme 4: Negative Psychological Effects

The high levels of job demand and low control / decision latitude identified within the data appeared to manifest in participants reporting high levels of stress (this was particularly

pertinent during night shifts) and individual perceptions of their own inadequacy. Negative language was used repeatedly, with terms such as “worthless”, “frustrated” and “terrified” being used to describe how staff members felt about their ability to do the job. In addition to describing their own feelings, staff members often described their colleagues experiencing negative emotions as a consequence of demands placed upon them by the workplace environment (52).

> *“When you can’t spend that time with someone, it’s really frustrating and you feel a little bit worthless, and that’s purely because you’re, like, actually I can only see this many patients today, and these are the ones that are most important. Even then you can’t do as much as you’d like to do with them.” Physiotherapist, 0017*

> *“she’s almost in tears because she knows that all these shifts are going to be short staffed” Senior Nurse, 0009*

The impact of the physical structure of the critical care unit was also highlighted to have a negative impact on both individual and team morale.

> *“But I don’t think that’s cohesive, it doesn’t work well with teams, nurses, camaraderie, because you’re then left with isolation.” Consultant Doctor, 0023*

Further supporting qualitative data for this thematic framework can be viewed in Appendix 6.

4.4.1.3.2. Framework for future leaders

The data within this thematic analysis facilitated the generation of a framework illustrating the key areas identified (Figure 21). It also highlights potential opportunities for leaders / senior members of the team to provide more junior members of staff with some control over their workload that day. Many of the factors identified are unmodifiable (such as patient acuity and availability of beds), but this framework provides suggestions on how to mitigate the feelings of loss of control and low decision latitude in areas that may be amenable to change (52).

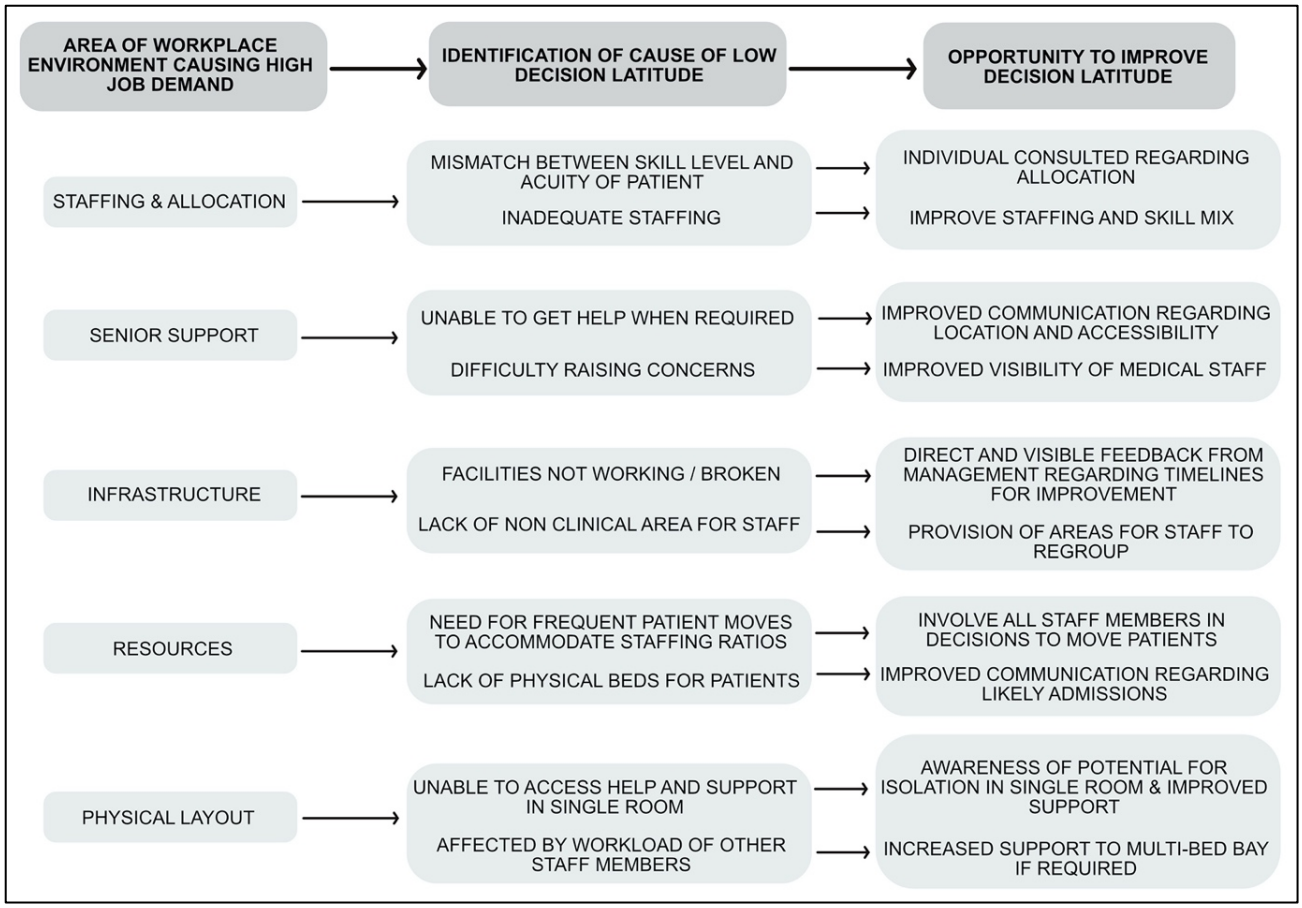


Figure 21. Framework demonstrating pathways for identification of increased job demands, areas of low decision latitude and suggestions for improvement of decision latitude (52).

4.5. DISCUSSION

This large study explored three key areas – psychological safety, staff attitudes to safety and the psychological impact of the workplace environment using a mixed methods approach. Due to the breadth of the research objectives and the length and number of qualitative interviews, the data collection methods yielded a significant amount of data. To utilise this large amount of data appropriately, data were divided and analysed in three separate workstreams, each addressing one of the study's three research objectives.

Whilst distinct, there are overlapping and recurrent themes regarding psychological safety and stress across the three analyses. These contribute to a greater understanding of how multiple factors within the critical care setting can all contribute to the creation of a cohesive working environment where staff work together to deliver safe care for patients, whilst feeling psychologically safe.

Psychological Safety

Existing studies exploring psychological safety in the healthcare environment are typically focused upon an individual's ability to speak up (224, 229, 230), and the antecedents to a psychologically safe environment (209). A recent mixed methods study exploring psychological safety in healthcare teams identified indicators of psychological safety at the individual, team and organisational level. This study highlighted the importance of familiarity and support in promoting a psychologically safe environment (295).

The analysis presented in this chapter builds upon existing work and answers questions posed in the psychological safety literature regarding the influence of psychological safety on work outcomes, the dynamic nature of psychological safety and the potential for negative consequences (28, 38).

Broadly speaking, the participants in this study provided a positive account of their experiences and feelings of psychological safety within the critical care environment. The experiences reported and that form peoples' views will of course not just have been derived from their current position, but will also encapsulate wider professional experience, which may encompass clinical environments other than critical care. Whilst the data demonstrated room for improvement – not all participants felt psychologically safe across all domains in the assessment – there was sufficient evidence within the quantitative and qualitative data that a good climate of psychological safety was generally present. This allowed the exploration of how psychological safety manifests and what affects its presence. This analysis built upon the background literature review and novel concepts produced within the evidence synthesis (3.4.3). Identifying a strong presence of psychological safety in the study groups also generated the opportunity to explore what the consequences of this environment might be. The possible negative consequences of psychological safety became a prominent theme within this analysis, addressing a clear question posed within the psychological safety literature (38, 293).

The first significant finding within this section of the data analysis is the influence of situational context on psychological safety. Building upon the model developed within the evidence synthesis the data in this study highlight additional factors relating to situational

context that affect a climate of psychological safety. The model demonstrates the recurrent factors at the individual, team and organisational level that are relevant in a healthcare setting. Whilst these additional factors were identified within a critical care environment, it is likely that they can be generalised across other healthcare environments. Whilst heightened and perhaps more time-critical in critical care, the challenges faced in delivering patient care and creating optimal teamwork are present across most clinical settings.

Understanding the role of context in every clinical scenario is important and an essential part of improving psychological safety within the clinical environment.

Whilst some contextual factors are fixed (such as the location of the ward round), others are variable. Dynamic factors that influence the situational context and subsequently psychological safety include:

- The volume and complexity of the clinical workload
- The influence of personality, culture and experience on team dynamics
- Provision of alternative routes and locations to speak up
- Clarity regarding each individual's role and responsibilities

The model developed in this study can assist team leaders in recognising these dynamic and modifiable factors that influence the context of the situation and subsequently psychological safety within their own team. Providing reassurance to the team, encouragement to speak up, alternative opportunities to raise ideas and clear communication regarding expectations will all help mitigate the barriers and promote factors that foster a culture of psychological safety (52).

A second significant finding within this analysis stream is the presence of potentially negative consequences of a psychologically safe environment. Data corresponding to this phenomenon were identified as the qualitative interviews progressed and the subject was subsequently incorporated into the topic guide in an iterative manner. It is often assumed that psychological safety is universally beneficial and should be promoted in every situation. A recent review of psychological safety (37) raised the question that there may be negative effects of psychological safety and has drawn attention to this as an area for future research. The qualitative data in this study provide evidence to corroborate this suggestion and highlight several ways in which high levels of psychological safety can have negative consequences, some of which are specific to the healthcare setting (for example during

emergency clinical scenarios) and others which are more generalisable to all workplaces (such as distraction of the team leader). These negative aspects only become prominent when a high level of psychological safety is present, as without an environment where individuals feel free to take a risk (for example – working within a psychologically safe culture that encourages speaking up to raise concerns), these negative aspects do not manifest (296).

These negative consequences manifested in three key sub-themes within the analysis – that of "bandwidth", "context" and "motivation to speak". Understanding the reasons underpinning the occurrence of negative consequences allowed for the development of potential solutions that can be implemented to minimise the risk them occurring. Again, these solutions require an overview of the working environment to be observed and considered by team leaders, identifying the points at which they occur and using this information to implement changes.

Many participants in senior positions found that they were at risk of distraction and fatigue, with their "bandwidth" often becoming overloaded. This could be minimised by providing clear signposted opportunities for individuals to speak up, thereby reducing the risk of constant questioning and interruption.

There were two key areas within the sub-theme of context which appeared to lead to negative consequences of psychological safety. In time-critical situations, perceived psychological safety allowed multiple opinions and ideas to be raised, taking up valuable time and risking patient safety. This may be improved by providing opportunities to contribute at a more appropriate time or by emphasising the time-critical nature of the situation.

Hierarchy also had an important influence. Whilst a flatter hierarchy is known to promote psychological safety, conversely it may facilitate some of the negative aspects to psychological safety as demonstrated within our analysis. Many participants were in agreement that a steep hierarchy was a negative concept, but also wanted clear leadership within the team. This clear leadership may be crucial in managing negative consequences of psychological safety, subsequently protecting the team leader (293).

The third sub-theme demonstrated how a psychologically safe environment could facilitate voices and contributions with other motivations, such as undermining others and promoting oneself. It is difficult to truly ascertain an individual's personal motivation for speaking up, but

it may be worthwhile for team leaders to bear this in mind if the psychologically safe environment is allowing a team member to speak freely, and this is taking the form of criticism – or that their negative opinions are becoming problematic for the functioning of the team as a whole (293).

Mitigating these negative consequences is not only the responsibility of the team leader, but of those within the team – utilising their own ability to weigh up the context of the situation, the urgency of the concern and the workload of the senior decision maker. It is worth remembering that these negative consequences must be managed and mitigated in a way that does not interfere with the psychological safety of the working environment – for example, the team leader clearly signposting opportunities for individuals to be an active member of the team, but simultaneously minimising the risk of distraction and allowing space for decision making (293).

Attitudes to Safety in the Critical Care Environment

There is a significant body of existing work exploring safety in the healthcare environment, all with the common aim of minimising error (297, 298). Medical errors have been linked to stress in healthcare workers (299), with strategies to support these staff members being proposed (300). In addition the converse has been demonstrated – high staff stress has been identified as a causative factor in medical error (301, 302). The second objective within this research study aimed to evaluate the safety attitudes of the participant group, with a view to understanding how this can affect the manifestation of stress and psychological safety.

Reassuringly, the quantitative and qualitative data reflected the viewpoint that participants perceived their working environment as safe.

The results of the SAQ generally supported the perception of positive attitudes to safety within the workplace, with participant views being concordant across all domains. The triangulation of these data with qualitative interview data provided the opportunity to explore the factors contributing to this perception.

The impact of inadequate staffing (whether that be the number of staff themselves or the skill mix within the team) was a strong theme within the qualitative data. This theme was also

represented in the SAQ with disagreement that the critical care units had staffing levels "sufficient to handle the number of patients". It is clear from these data that feeling confident that the team is adequate (both in number and skill) and able to deal with the workload is a significant factor in individuals feeling confident that their workplace is safe for patient care. Whilst improving staffing levels is not without significant challenge – staffing crises within the NHS are longstanding and despite attempts to improve recruitment (11) remain an issue – with workforce forecasting repeatedly highlighting future staff shortages. This shortage is compounded by increasing numbers of staff leaving the workforce early – an issue highlighted in the preliminary study (where a number of critical care consultants expressed a desire to retire early) (292).

The data in this study demonstrate that a safe working environment is inextricably linked to the incidence and handling of medical error. SAQ data was encouraging regarding the management of error, however when discussed in depth during the qualitative interviews variable viewpoints were elicited. These included reflections on why errors occurred, how they were managed and an individual's personal response to making an error. Many of the reasons "why" an error occurred related to other themes within the qualitative data set – being influenced by workload, stress and inadequate staffing levels. Interestingly, there was a sense of these factors being difficult to modify, and a subsequent acceptance that the occurrence of an error was therefore almost "inevitable". This is a key point for team leaders in more than one respect. Firstly, the belief that stress and an unmanageable workload is unmodifiable is not strictly true – managers can look for areas within the clinical workplace where more support can be provided, with the aim of subsequently minimising the sense that errors are bound to happen. Many participants reported working "outside of their comfort zone", feeling that this would also lead to error. Again, with proper support, adequate training, allocation of new responsibility only when appropriate and the improvement of staffing where feasible it may be possible to minimise this.

It was clear from the data analysis that an open culture to error reporting was present and that error reporting was encouraged – although participant views on this and the subsequent ways in which such reports were handled were heterogenous. Some participants held strikingly opposing views regarding the presence of a blame culture (often influenced by their

own prior experience, or the observed experiences of others) should errors occur and be reported. Despite good results for the presence of psychological safety in the first analysis, a perceived blame culture is likely to minimise participants willingness to speak up, possibly highlighting that psychological safety (whilst generally present) is not universal. This, in addition to the fact that it was perceived by several participants that their error reports did not receive meaningful feedback, or that there was a lack of learning from errors indicates that improved communication following error reporting would be beneficial.

Positively, participants were predominantly in agreement that the teamwork in their workplace was good, with higher scores both for each related Likert item and the combined Likert scale. The SAQ demonstrated that participants took pride in their working environment, with many feeling well supported and that all staff opinions were heard and respected. Qualitative data supported this, although again provided a more balanced view – demonstrating both good and bad examples of teamwork and how they could impact a safety climate. Notably, when the team came together in an organised fashion (for example in scheduled safety briefings) this was described as being beneficial and promoting a safe environment. Linking this to psychological safety, and the concept of the impact of situational context, providing clear opportunities to speak can improve the perception of a safe environment.

Data from the stress recognition climate within the SAQ highlighted that participants felt negatively affected in their ability to do their job adequately when fatigued or faced with challenging situations. Linking to the subtheme of error, many participants described marked distress and stress if implicated in an error – highlighting an area where team leaders may be able to identify and provide increased support to staff in these situations.

Whilst the perception of a safe culture and positive attitudes to safety were identified within the data, many themes within this analysis were heterogenous, with both positive and negative (and occasionally opposing) ideas and perceptions around safety being present. The data in this analysis can be used to facilitate the identification of areas that can be modified through improved resourcing, leadership and communication in order to improve the safety culture and staff attitudes to safety. These ideas were brought together into a framework,

including potential suggestions where team leaders can implement improvements that may lead to the promotion of a safer environment.

Whilst not an overt aim of this analysis stream, it was noted that five of the Likert items within the SAQ reflected components of a psychologically safe environment. When reviewed from this perspective, participants perceived themselves to be working in an environment of psychological safety. The SAQ is not a validated method of assessing psychological safety, but these five statements correspond well to its definition, and support the conclusions made in the first analysis.

The Impact of the Workplace Environment (52).

The workplace environment has been shown to be significant for employee wellbeing and productivity, both in and out of the healthcare setting. A study in public sector organisations describes the workplace environment as being influential on employee motivation and performance (303). A broader study assessing its impact on an individual's stimulation evaluated 16 organisations within the U.K., finding elements such as layout and regular breaks promoting engaged and efficient employees (304). A cross-sectional mixed-methods study examined the relationship between workplace environment characteristics and the health and performance of healthcare workers (305). This identified key characteristics such as proper lighting, ergonomic equipment and adequate space to perform daily tasks as being beneficial. The Job Demand Control model has also been employed within the healthcare setting. This model was mapped to the results of a questionnaire study exploring job strain in 200 acute care nurses, highlighting the importance of control and decision latitude (306).

The third analysis stream within this study focussed upon qualitative data that related to the Psychological impact of the workplace environment. This analysis builds upon existing literature by exploring the workplace environment in the critical care setting, relating this to stress and psychological safety, and mapping the findings to the Job Demand Control model. The thematic analysis of these data led to the creation of a framework highlighting areas identified as causing high job demands and low decision latitude within the critical care environment.

This framework takes the form of a pathway demonstrating potential points of modification within the workplace environment. These modifications would allow individuals to have increased control & decision latitude, thereby reducing job strain and the risk of negative psychological sequelae developing.

This section of the analysis led to analytical themes that corroborate existing literature regarding the stresses staff face in critical care, including high workload and organisational challenges (83, 291). Unique aspects to the critical care environment include the high acuity of the patients, inability to leave a patient unattended and the requirement for 1:1 nursing ratios. The qualitative data identified and coded as relating to the impact of the workplace environment demonstrate that these factors can contribute to increased job demands and have a negative psychological impact on staff members, particularly when considered in the context of single patient rooms.

This analysis also provides novel information that contributes to the literature regarding the impact of the working environment (74, 307) as the participant group encompasses the multi-disciplinary team (in contrast to most studies focusing only on nursing staff (62, 69, 76, 308)). This highlighted issues such as visibility of medical staff and how the frequent moving of patients around the critical care unit can impact different staff groups in different ways.

The job demand control model emphasises that it is not the job demands themselves which are potentially harmful for the individual, but the lack of decision latitude (72). Many of the factors identified in this thematic analysis as leading to high demand and low control are not modifiable – physical bed spaces, patient acuity and the frequency of admissions are all relatively fixed irrespective of the strain this may place on the healthcare system. Inadequate staffing levels provide a constant source of challenge within the critical care environment, although these may be more modifiable than patient related factors due to the possibility of filling shifts with temporary staff (in the short term) and recruitment drives to assist in longer term staffing solutions. In addition to numbers of staff, the skill mix present for each shift (ensuring that individuals have the range of competencies required, there is an adequate ratio of senior to junior staff grades and that there are a mix of specialities within the multidisciplinary team (309)) is important. Ensuring each clinical shift has an adequate skill

mix can be difficult, but again has the potential to be improved through planning, temporary staffing and recruitment.

Support and respect from those in leadership positions can improve decision latitude and control by listening to concerns and acting upon them where possible. In the context of inadequate staffing, an element of control can still be provided to individuals – by giving individuals more input into staff allocations, allowing them to express fears regarding feelings of isolation and improving support for those feeling isolated.

Short staffing and required nursing ratios in critical care often necessitate the need to move patients around the unit. This itself is likely to be unmodifiable in the absence of improved staffing, however involvement of all members of the multidisciplinary team in the decision making may improve feelings of control.
Often nurses reported feeling isolated, particularly when allocated to single rooms. This combined with a reported lack of visibility of the medical teams was reported as leading to increased stress. This could be mitigated by addressing the need for a physical presence of medical staff or improving communication regarding the location and accessibility of help as and when required. Improved resources and investment in infrastructure (including improved feedback from those in leadership positions who receive reports of damaged/poor infrastructure) would lead to higher feelings of decision latitude and an individual's feelings of control.

These factors are unlikely to be unique to the critical care units included in this study, and as such the conclusions from this thematic analysis will be transferable to other departments. Even so, each individual critical care unit will have its own team dynamics, unique resource issues and problems with infrastructure. The themes and framework developed through this thematic analysis can be used to help leaders and managers identify the areas within their own workplace environment that can be developed to improve the control each individual staff member feels, and as such help to mitigate the psychological impact associated with such high job demands (52).

4.5.1. STUDY LIMITATIONS

This study has some limitations. Whilst thematic saturation of qualitative themes was achieved during study recruitment and subsequent qualitative data analysis, it is still possible that some themes regarding psychological safety, attitudes to safety and the impact of the workplace environment within the study sites were not represented. There is also the risk of participation bias – those with a proactive interest in safety and quality improvement, (or conversely those who do not feel psychologically safe) may have been more willing to participate in this study.

The quantitative data within this mixed methods study provide evidence to support the presence of the climates studied, particularly when triangulated with qualitative data. However, the conclusions drawn from the quantitative data are only reflective of the study population, as the sample size and sampling strategy is not appropriate to be able to make generalisations about the presence of psychological safety or attitudes to safety across the critical care working population as a whole. Additionally, the qualitative data provide a detailed account of psychological safety within our participant groups, but the study was not designed to answer questions regarding the psychological safety of NHS workers as a collective. In order to generate more robust and widely applicable solutions to wellbeing concerns throughout the NHS there would be value in extending this study to other sites. The qualitative frameworks developed in this study could be utilised to analyse similarly obtained qualitative data according to a deductive approach. This would facilitate an assessment of whether the perceptions of psychological safety and safety attitudes observed within this study are similar across a range of critical care departments and other acute care environments.

The negative psychological consequences identified in this study, particularly with regard to the impact of the workplace environment, are as reported by each individual. A validated tool (for example, utilising the Maslach Burnout Inventory (87) to evaluate the presence of burnout and emotional exhaustion) was not used to assess these consequences further. This highlights an area for future exploration, obtaining quantitative data regarding negative psychological effects and analysing this in the context of stresses created by the workplace environment.

4.6.CONCLUSION

4.6.1. OVERALL LESSONS FROM STUDY

This study provides several unique contributions to the literature. With respect to psychological safety, this study did so in two ways. Firstly through identifying and extending what is known about the role of situational context in creating an environment of psychological safety and secondly by introducing and expanding upon the possible negative effects of a psychologically safe environment within the healthcare setting. These negative consequences are the product of a psychologically safe environment, suggesting that the creation of such an environment will not solve all potential teamwork and safety issues.
The study also contributed to the literature with a detailed analysis on the impact of the working environment – highlighting nuanced factors relevant to critical care not previously studied and demonstrating areas where team leaders can influence job demands and decision latitude within this setting to improve staff wellbeing.

The analysis regarding staff attitudes to safety in the critical care environment yielded a wealth of information about perceptions of safety, error and factors that contribute to this environment. This built on existing literature regarding safety culture and error (310-312), and led to an improved understanding of what led to stress and poor wellbeing within the critical care workforce. Notably, the qualitative data relating to attitudes to safety was heterogenous, with multiple and often opposing viewpoints on the presence of a safety culture. This highlights that initiatives to improve safety should not be a “one size fits all” model, and must be flexible, taking into account the specific needs of those working in the environment at any particular moment.

All three analysis streams within this study generated frameworks and models that can be used by team leaders to identify areas for improvement. The improvement of psychological safety, a safety climate and a reduction of staff stress has positive implications for both individual healthcare worker’s wellbeing and the safety of the organisation.

4.6.2. CONTRIBUTION TO THESIS RESEARCH OBJECTIVES

The three analyses within this study provided a holistic view of the multiple forces and factors within the critical care workplace that contribute to an individual worker's experiences (both positive and negative). This holistic view encompassed structural influences (such as the presence of side rooms) and organisational factors, through to team and individual factors.

This study was intended to address components of all four research questions within this Thesis and was successful in this aim.

It yielded a wealth of data and understanding regarding psychological safety, which significantly contributes to answering the first two research questions. All three analysis streams identified the presence of stress within the workforce studied (with particular emphasis on the influence of the workplace environment), providing data to answer the third research question. In addition, it provided a baseline understanding of the nature of safety attitudes within critical care, insight into how these occur and how they can be mitigated. This combined with data investigating the organisational culture and impact of psychological safety begins to address the fourth research question.

4.6.3. INFORMING FUTURE WORK

Several themes identified within this study were used to inform the remaining two studies planned for this PhD programme. These studies incorporated other professional groups working within the healthcare setting, and both had the exploration of psychological safety as a major aim. To further build upon the novel results of this study further investigation of the potential negative consequences of psychological safety was incorporated into topic guides for future qualitative interviews.

An enhanced awareness of the presence of and contributing factors to stress in healthcare staff as identified in this study provided the basis and rationale for examining this further. Areas identified for further exploration included the aetiology of stress, the psychological manifestation of this stress and any subsequent detrimental effects to both staff and the organisation.

Teamwork was also a prominent theme, both explicitly within the second analysis stream of this study and featured in the other two analyses – with participants discussing the impact and manifestation of working relationships, hierarchy and team cohesiveness. This was used as a basis to design further exploration of working relationships and team dynamics and how personality might influence this.

5. CHAPTER 5: THE INFLUENCE OF PERSONALITY ON PSYCHOLOGICAL SAFETY, THE PRESENCE OF STRESS AND CHOSEN PROFESSIONAL ROLES IN THE HEALTHCARE ENVIRONMENT

5.1.INTRODUCTION

5.1.1. RATIONALE FOR STUDY

This study aimed to build on the understanding gained regarding the manifestation and impact of psychological safety and stress by exploring how an individual's personality may influence their occurrence. In addition, the participant group was expanded from solely critical care workers to include those working in the emergency department. It was anticipated that by exploring these phenomena in different working environments more detail on the influence of the workplace environment on stress and the presence of psychological safety would be elicited.

In addition to investigating the influence of personality on psychological safety and stress, it was anticipated that exploring the personality types of those working in two challenging but different clinical environments would allow for an assessment of whether different personality types predominated in distinct clinical areas. This subsequently leads to the question – do individuals self-select for professional roles they are more suited to, based upon their predominant personality traits? It was hypothesised that the emergency department – an unpredictable and dynamic setting, would attract different individuals to those preferring to work in the more controlled environment of critical care.

Despite differences in role-related demands and the presence of unique stressors within particular clinical departments, the broad person specifications (313) and job requirements are often similar for these roles. Consequently, individuals are not matched to professional roles they might be best suited to, but typically choose their own clinical role with minimal external guidance. This potentially risks higher levels of stress and dissonance for individuals if they are not suited to the demands of the workplace environment. Knowing that different personality types are present, either across clinical departments or within smaller clinical teams is useful for those in senior positions. Possessing a greater understanding of the

personality types of the individuals working within each clinical team may facilitate team leaders and managers support staff by "knowing" team members better, particularly how they may respond to stressors. This in turn may improve job satisfaction, career longevity and ultimately improve patient safety.

The study was predominantly designed to address the second research question within this PhD programme but would also provide data that contributed to answering the other three research questions.

1. What is the presence and consequence of psychological safety within the healthcare workforce?

2. What factors influence a psychologically safe environment within the workforce, with particular focus upon the influence of personality.

3. What factors contribute to the presence of stress within the workforce, with particular focus upon the influence of the workplace environment.

4. How do psychological safety and stress impact individual wellbeing and organisational safety?

5.1.2. HYPOTHESES

The study was designed to test four hypotheses:

- There are identifiable differences in the personalities of those working in critical care in comparison to those working in the emergency department.
- Individuals working in healthcare environment have distinct personality profiles when compared to general population samples (133).
- There is a relationship between an individual's predominant personality traits and the clinical situations they perceive as extremely stressful.
- High levels of psychological safety as perceived by participants are associated with predominant personality traits.

In addition, the study aimed to further explore the potential negative consequences of psychological safety (4.4.1.1.4).

5.1.3. RESEARCH AIMS

There were four main research aims within this study:

1. To investigate the personality profiles of our groups of healthcare workers, exploring for differences according to the clinical environment in which an individual works, and comparing our data on healthcare professionals to stratified norm data from the general population (133).
2. To identify which clinical situations staff members perceive as extremely stressful and explore for correlations between this and individuals' personality traits.
3. To investigate for the presence of a relationship between an individual's level of psychological safety and their predominant personality traits.
4. Explore for further evidence of the potential negative consequences of psychological safety.

5.2. PRELIMINARY WORK: HOW DO CRITICAL CARE STAFF RESPOND TO ORGANSATIONAL CHALLENGE – A QUALITATIVE EXPLORATION INTO PERSONALITY TYPES AND PROCESSING IN CRITICAL CARE

This design of this study was informed by a piece of preliminary work (completed at the beginning of this PhD programme), exploring the response of critical care staff to organisational challenge. The analysis explored correlations between this response and an individual's predominant personality traits.[9] This preliminary analysis was based upon a qualitative case study by SJB, EM and DL, designed to increase understanding about cognitive processes exhibited by staff members in challenging situations. To do this, critical care staff were interviewed about a fictional staffing scenario examining their perception of risk and

[9] This preliminary work has been published in PLoS One as open access under a Creative Commons Licence (CC-BY). All authors have agreed to its adaptation and inclusion within this thesis.
64. Grailey K, Murray E, Billings J, Brett S. How do critical care staff respond to organisational challenge? A qualitative exploration into personality types and cognitive processing in critical care. PloS one. 2020;15(1):e0226800.
Contributor Statement: The study was conceptualised by KG, EM and SJB. KG was responsible for data analysis and preparation of the original draft manuscript. All four authors edited and reviewed the final manuscript.

safe staffing (63). An emergent theme in this analysis was the presence of perfectionist and pragmatic tendencies in critical care staff when making decisions.

This signal that different behavioural tendencies existed within Critical Care warranted further exploration. Further analysis of these qualitative data was undertaken, to build knowledge and understanding in two key areas. First, the potential influence of personality, how it can be assessed and its possible relevance in healthcare workers. The second objective was to further develop an understanding of how critical care staff respond to stress and times of challenge. To achieve this a mixed methods study was designed to further explore the presence of pragmatic / perfectionist tendencies in critical care staff, by analysing qualitative interview transcripts and triangulating this data with a validated assessment of personality. During data collection in the original study all participants had also undertaken a 16 Primary Factor (16PF) personality assessment, data which had not been analysed within the original study.

The participant group demonstrated mid-range scores for most of the 16 primary factors assessed. There were some exceptions, with higher or lower scores predominating for some factors indicating a pattern within the personalities of our sample cohort (64). Of note, participants had particularly low scores for "*vigilance*" as a group. The prevalence of personality factors in the participants in our sample (n=31) is illustrated in Figure 22.

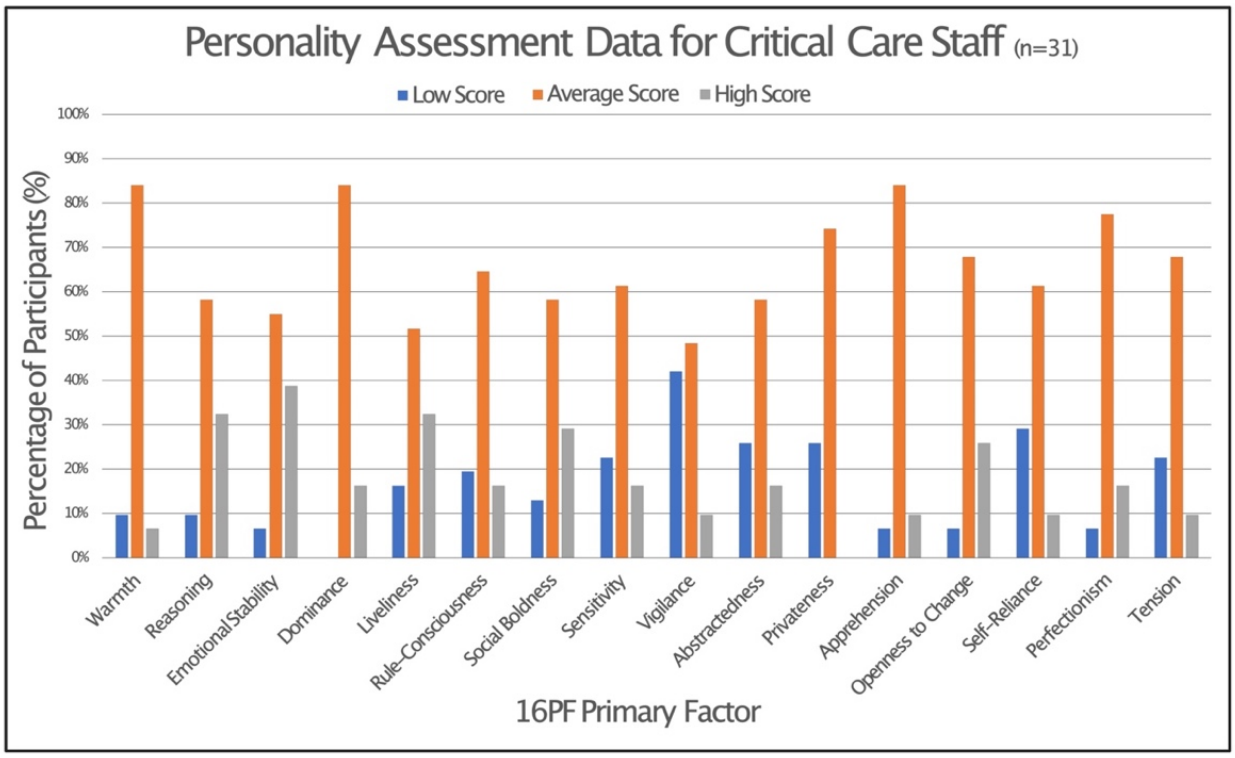


Figure 22. Distribution of 16PF STEN Scores in the participant group (Modified from published figure (64))

Within this sample, 19 individuals were found to be balanced in their approach to solving organisational challenge, 8 took a predominantly pragmatic approach and 4 were perfectionist. Of note, those with a predominantly perfectionist approach appeared to be more stressed and at risk of increased cognitive dissonance when faced with organisational challenge than their pragmatic counterparts.

The analysis supported a hypothesis that different behavioural groups exist within the critical care environment, and that some individuals may be at more risk of suffering stress and negative psychological consequences as a result of organisational challenges.

The data also highlighted a signal that there may be predominant personality types within critical care, different to previously documented personality profiles in other groups of healthcare workers and general population data (133). This signal justified further exploration, both within a larger sample of critical care workers and expanding to other clinical specialties.

5.3.METHODS

5.3.1. RECRUITMENT

Participants were recruited from two Emergency Departments and three Critical Care Units within Imperial College Healthcare NHS Trust. Recruitment was according to a purposive sampling technique, ensuring the multidisciplinary teams of both clinical environments were represented.

Participants were invited to participate in the study through email, physical posters and by attending meetings / providing teaching sessions to advertise the study.

Inclusion Criteria:

- NHS healthcare staff working within the emergency department or the critical care department
- Participants must be English Speaking

Exclusion Criteria

- Agency staff, NHS staff not working within the two pre-defined clinical areas, service users and the general public.

5.3.2. STUDY DESIGN

Mixed methodology was utilised to address the first three research aims within this study, with purely qualitative data analysed to address the final objective. Quantitative data regarding participant's personality traits were obtained using the validated 16PF Assessment. The influence of personality as perceived by participants was explored and investigated using semi-structured qualitative interviews.

Two further quantitative assessments were contained within the qualitative interviews. These were designed to evaluate which factors participants found most stressful within their working environment and to provide a measure of their psychological safety. This was the same assessment of psychological safety as utilised within the "Attitudes to Safety" study (4.3.2.2), to facilitate comparison across studies. These topics were also covered within the qualitative interviews to allow subsequent triangulation of the data.

A triangulation approach was employed to analyse the mixed methods data, with interpretations based upon the incorporation of multiple data sources. This triangulation was intended to explore the influence of personality on the clinical role participants had chosen, and how personality might influence perception of stress and psychological safety. In addition, it was anticipated that the qualitative data would provide an understanding of how personality might affect teamwork and working relationships.

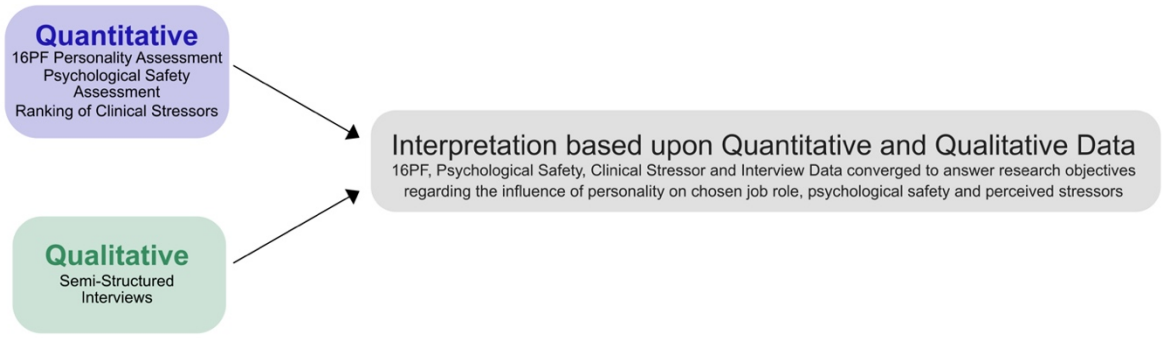


Figure 23. Triangulation approach to analysing mixed methods data incorporating qualitative interviews, quantitative surveys and the 16PF personality assessment

The study was reviewed and approved by the Imperial College Research Governance and Integrity Team (Reference number: 19HH5394), Imperial College NHS Trust and the Health Research Authority (Reference number 19/HRA/4541). Adaptations were made to the study methodology and data collection due to disruptions caused by the COVID-19 pandemic. Non-substantial amendments were submitted and approved as required.

5.3.2.1. Adaptations to Study Timeframes and Methodology

The original timeline for this study planned to start participant recruitment in September 2019. This occurred as intended, however a 3-month interruption to the PhD programme took place between October 2019 and January 2020 as I recovered from a fractured neck of femur. Study recruitment and participant involvement restarted at the end of January 2020, however a second interruption of studies took place from the 1st of April 2020 for a further 3 months as a consequence of the COVID-19 pandemic. This was due to the requirement for me to return to full-time clinical practice as part of the pandemic response, and a pause on all non-COVID research during this time.

A small number of participants were interviewed in the time between interruptions, but the majority of data collection for this study took place following the end of the second interruption, beginning in July 2020.

Several adaptations to the study methodology were made as a consequence of the COVID-19 pandemic and social distancing restrictions.

Firstly, all qualitative interviews after July 2020 were conducted via the Microsoft Teams platform, with good success (2.1.1.1). During the initial design of the study, focus groups were planned with the aim of generating a list of the most commonly experienced clinical stressors within the clinical setting. This approach was adapted due to concerns that that controlling the dynamics of different seniorities and specialties within each focus group would be very difficult via a virtual platform. As such a thorough literature review was undertaken to identify common clinical stressors. Five key stressors identified in this review were then used to create the survey for this study.

5.3.2.2. Administration of 16PF Assessment and Feedback

Formal training in the administration and interpretation of the 16PF assessment was undertaken prior to study recruitment. This provided me with the skills to feedback personality data to participants and correctly interpret the meaning of scores for each primary factor.

Once recruited, participants were sent a unique electronic link to their 16PF assessment. This originated from the PSI 16PF platform (1.1.6.2), and participants were able to complete the assessment at a time and location of their choosing. Participants were in possession of the participant information sheet prior to receiving their assessment link and had been provided with the opportunity to ask any questions. As accessing the assessment was voluntary this was taken as implied consent.

Once completed assessments are scored within the PSI platform, STEN scores (alongside a report outlining key personality traits) are made available to the researcher securely. At this point a time for 16PF feedback and the qualitative interview were scheduled with each participant.

5.3.2.3. Qualitative Interviews

During the 16PF feedback meeting, informed consent was obtained for a short qualitative interview. The entire duration of the meeting was planned for 60 minutes, with approximately 40 minutes allocated for 16PF feedback (not audio recorded) and the remaining 20 minutes for a short qualitative interview. These meetings took place in private rooms of the participants choosing on hospital sites, or virtually (either at home or at work, as determined by the participant).

The topic guide was informed by the results of the previous studies in this PhD programme – particularly with relation to psychological safety, stress and teamwork, along with knowledge gained during background literature reviews (Appendix 7).

The main themes to be covered during the interviews included:

- Influence of personality within the clinical environment and its impact on teamwork.
- Perceived stressors within the workplace and their impact.
- The presence and manifestation of psychological safety.
- Potential negative consequences of psychological safety.

5.3.2.4. Quantitative Survey Data

Two quantitative surveys were contained within the qualitative interviews. Participants were asked to rank 5 commonly identified stressors within the clinical setting, from “most stressful” to “least stressful”. In addition, the validated assessment of psychological safety was incorporated (4.3.2.2) (26), with participants stating their agreement with 7 Likert items (either “agree”, “neutral” or “disagree”).

5.3.2.4.1. Development Of Clinical Stressors Survey

In order to obtain a list of key stressful scenarios within the clinical setting, a literature review was undertaken. Twelve studies and articles that addressed this issue within healthcare were identified by searching electronic databases (PubMed and Google Scholar). These were reviewed for content relating to stressful factors and data subsequently extracted and complied.

Key themes and commonly occurring factors were then identified, leading to the construction of a list of 5 key stressors that could subsequently be ranked by participants (Table 13).

Table 13. Results of literature review designed to identify commonly occurring clinical stressors

Source	Stressful factors Identified
"Stress and stress management in health institutions" Boyaci et al. (314)	Fear of patient dissatisfaction and complaints Economical insufficiency High risk of having accidents Work ignored by others
"Job stress and burnout in hospital employees: comparisons of different medical professions in a regional hospital in Taiwan" Chou et al (315)	High workload Job strain Overcommitment Low social support
"A longitudinal, mixed methods investigation of newly qualified nurses' workplace stressors and stress experiences during transition." Halpin et al (316)	Witnessing Death and dying Conflict with physicians Inadequate preparation Lack of support Conflict with other nurses Workload Uncertainty concerning treatment
"Stress and wellbeing in healthcare staff: The role of negative affectivity, and perceptions of job demand and discretion" Tyler et al (317)	Lack of resources Workload
"Employee Stressors and Wellbeing of Healthcare Workers in Government owned Hospitals in Calabar, Nigeria" Angioha et al (318)	Workload Working overtime
"Job burnout and occupational stressors among chinese healthcare professionals at county-level health alliances. International journal of environmental research and public health" Liu et al (319)	Vocational interest Doctor patient relationship Interpersonal relationship
"Key occupational stressors in the ED: an international comparison." Greenslade et al (320)	Heavy workload and poor skill-mix Death or sexual abuse of a child Inability to provide optimum care Workplace violence Mass casualty incident High-acuity patients Environmental concerns – e.g., overcrowding Concerns about treating a critically injured or dying family member or friend Poor professional relations Crisis management and bereavement Concerns about professional development Medicolegal concerns Infectious diseases exposure Administrative or budgetary concerns Dealing with the media
"Occupational stressors among nurses working in urgent and emergency care units." Pereira et al (321)	Staff management Requirement to perform tasks with minimum time available Attend emergency cases in the unit Interact with relatives of critically ill patients Noise level in the emergency room

	Physical environment of the unit Monitoring the quality of care Managing patient's death Development of routines, rules and procedures Meet the needs of family members Request review and repair Coordinate the activities performed in the unit Monitor the nursing team Staff assignment Supervise team activities
"Occupational stressors in nurses and nursing adverse events." Karimi et al (322)	Environmental factors Interpersonal interaction factors Patient care factors Administrative factors
"Occupational stress among healthcare workers in Japan." Ito et al(323)	Job overload Support from co-workers (lack of)
"Work-related stress, education and work ability among hospital nurses." Golubic et al(324)	Organisation of work and financial issues Public criticism Hazards at workplace Interpersonal conflicts at workplace Shift work Professional and intellectual demands
"Occupational stressors in oncology nurses: A qualitative descriptive study." Soheili et al(325)	Personal ability Physical environment arrangement Psychosocial safety in the workplace Organisational context

Following review of the themes within these papers, five overarching and recurring key stressors were identified and used in the survey:

- High Workload
- Conflict with Colleagues
- Patient Expectation
- Adequate Beds or Resources
- Risk of Making a Mistake

5.3.2.5. Plan for Data Analysis

Qualitative interview data were analysed continually during data collection as an iterative process. This contributed to the development of themes and an assessment of thematic saturation. It was upon reaching this point that recruitment to the study ceased. Audio interview files were transcribed with all personal identifying information removed and analysed using a thematic analysis technique (2.1.1.2.2). To confirm analytical interpretations these codes and themes were discussed within the wider research team throughout all stages of the analysis. 10% of the interview transcripts were selected at random and cross-coded by

a second researcher (AL) to assess for inter-rater reliability. A coding comparison enquiry was subsequently performed within NVivo (R1).

Quantitative survey and 16PF data were analysed within Microsoft Excel, with descriptive and inferential statistics investigated using SPSS v27.

As data for each 16PF trait is approximately normally distributed (133), an independent t test was used for the comparison of means between 16PF scores of those in ED and ICU, with Spearman's correlation analysis to explore the relationship and degree of relationship between "personality and psychological safety" and "personality and perceived clinical stressors".

Population data (with groups organised according to both country and profession) is provided in Cattell's 16PF Handbook (133) in the form of mean standard ten (STEN) scores for each trait (2.1.2) . In order to compare the personality data of the participant group to other external population groups, comparisons were made with Cattell's original data. Study participant data STEN means were compared with mean STENs for Cattell's original sample of Physicians, Nurses and a British population sample.

Quantitative data were subsequently triangulated with qualitative data to generate further analytical themes and explore the potential significance of the qualitative results within the clinical environment.

5.3.2.5.1. Analysis Strategy

This study was designed as an exploration into the influence of personality on individuals and teams working within two clinical areas within the hospital – critical care and the emergency department. This analysis took place as designed and will be presented first in this chapter.

This study co-incidentally took place during the COVID-19 pandemic, and resumption of the study in July 2020 was as the first wave of the pandemic was subsiding. As the topic guide was designed to explore stress, psychological safety and the impact of these on teamwork and staff wellbeing, it was inevitable that participants discussed their experiences of working during COVID-19 given the magnitude of the clinical events that had occurred in the immediate months prior to the resumption of data collection. The iterative nature of the topic

guide allowed for exploration of these themes relating to COVID-19 and its effect on participants working on the frontline.

This serendipitous timing of data collection allowed for unique insights into pandemic management across three large teaching hospitals in London, U.K. to be obtained, and the data relating to this were analysed distinctly from that relating to personality and the original research aims.

These two analyses took place sequentially, rather than reviewing and dividing the data as was done in the "Attitudes to Safety" study (Chapter 4). The entire data set were analysed in accordance with the original research plan, addressing the four research aims. Once complete, data from participants interviewed after the first wave of the COVID-19 pandemic were analysed. This second analysis was purely qualitative and utilised a thematic analysis technique.

5.3.2.6. Reflexivity

In addition to the study group outlined in 4.3.2.5, a different researcher conducted the inter-rater reliability for this study – AL is a physiotherapist and clinical research fellow. It was anticipated that there would be an influence of personality on perceived stressors, team dynamics and psychological safety, although there were no pre-conceived specific ideas as to how this would manifest. A reflexive position was maintained throughout the analysis to minimise the risk that any presumptions would affect the analysis and interpretation of the study findings.

5.4. RESULTS – THE INFLUENCE OF PERSONALITY

Sixty-three participants were recruited, 22 from the two emergency departments and 41 from the three critical care units within Imperial College NHS Healthcare Trust. All 63 completed the 16PF personality assessment and 58 went on to participate in a semi-structured qualitative interview.

Of these, 49 interviews occurred after the first wave of the COVID-19 pandemic and were conducted virtually. The demographics of participants can be viewed in Table 14. Semi-

structured interviews ranged in length from 9 minutes to 31 minutes with an average duration of 20 minutes. Thematic saturation (203, 326) was achieved within the first 50 interviews.

Table 14. Demographics of participants according to department, profession and seniority

Clinical Department	Number of Participants	Professional Group	Number of Participants	Level of Seniority	Number of Participants
Emergency Medicine	19	Nurse	4	Junior	3
				Senior (Band 7 and above)	1
		Doctor	15	Junior	10
				Senior (Consultant Level)	5
Critical Care	39	Nurse	24	Junior	18
				Senior (Band 7 and above)	6
		Doctor	9	Junior	3
				Senior (Consultant Level)	6
		Physiotherapist	6	Junior	4
				Senior (Band 7 and above)	2

Six interview transcripts (10%) were assessed for inter-rater reliability. Two hundred and forty-six codes relating to the influence of personality on teamwork and the working environment were generated during the thematic analysis and across these the percentage agreement ranged from 99-100%. A kappa coefficient of between 0.4-0.75 (fair to good agreement) was present for 2 codes and value of >0.75 (excellent agreement) in 214.

5.4.1. 16PF PERSONALITY DATA

Raw scores for each factor within the 16PF questionnaire are converted to Standard Ten scores ('STEN') and provided for each candidate. The score represents a point on a continuum where an individual's personality sits in comparison to the scores of the wider population. A participants position on the scale is referred to as low if they score <3, high if they score >8 and midrange for scores between 4-7. Those with either high or low scores will demonstrate a tendency to behave in an extreme manner for each trait, whereas those with mid-range scores are able to adapt and move between the two types of behaviour seen at each end of the scale, depending upon the situation (133).

A description of each primary factor can be viewed in Table 15.

Table 15. High and low descriptors for each 16 Primary Factor. Adapted by The Sage Handbook of Personality Theory and Assessment (129) with permission from S.R Conn and M.L. Rieke (1994) 16PF Fifth Edition Technical Manual (327)

16PF Scale Names and Descriptors		
Descriptors of Low Range	**Primary Scales**	Descriptors of High Range
Reserved, Impersonal, Distant	**Warmth**	Warm-hearted, caring, attentive to others
Concrete, Lower mental capacity	**Reasoning**	Abstract, Bright, Fast-Learner
Reactive, Affected by feelings	**Emotional Stability**	Emotionally stable, adaptive, mature
Deferential, Cooperative, Avoids conflict	**Dominance**	Dominant, Forceful, Assertive
Serious, Restrained, Careful	**Liveliness**	Enthusiastic, Animated, Spontaneous
Expedient, Nonconforming	**Rule-consciousness**	Rule-conscious, Dutiful
Shy, Timid, Threat-Sensitive	**Social Boldness**	Socially Bole, Venturesome, Thick-skinned
Tough, Objective, Unsentimental	**Sensitivity**	Sensitive, Aesthetic, Tender-minded
Trusting, Unsuspecting, Accepting	**Vigilance**	Vigilant, Suspicious, Sceptical, Wary
Practical, Grounded, Down-to-Earth	**Abstractedness**	Abstracted, Imaginative, Idea-Orientated
Forthright, Genuine, Artless	**Privateness**	Private, Discreet, Non-disclosing
Self-assured, Unworried, Complacent	**Apprehension**	Apprehensive, Self-Doubting, Worried
Traditional, Attached to Familiar	**Openness to Change**	Open to Change, Experimenting
Group-Orientated, Affiliative	**Self-Reliance**	Self-Reliant, Solitary, Individualistic
Tolerates Disorder, Unexacting, Flexible	**Perfectionism**	Perfectionistic, Organised, Self-disciplined.
Relaxed, Placed, Patient	**Tension**	Tense, High Energy, Driven

When analysed as a complete group (participants from the Emergency Department and Critical Care), most participants possessed midrange scores for each factor – demonstrating an ability to move between the two styles of behaviour at each end of the scale depending upon the requirements of their environment. Of note, there was a marked trend towards low scores for "*vigilance"*, corroborating data from the preliminary study (64). A tendency for lower scores was also noted for "*tension"*, "*abstractedness"*, "*privateness"* and "*self-reliance"*. Similarly, candidates tended to score at the higher end of the scale for "*openness to change"*. The distribution of 16PF scores for each trait are illustrated in Figure 24.

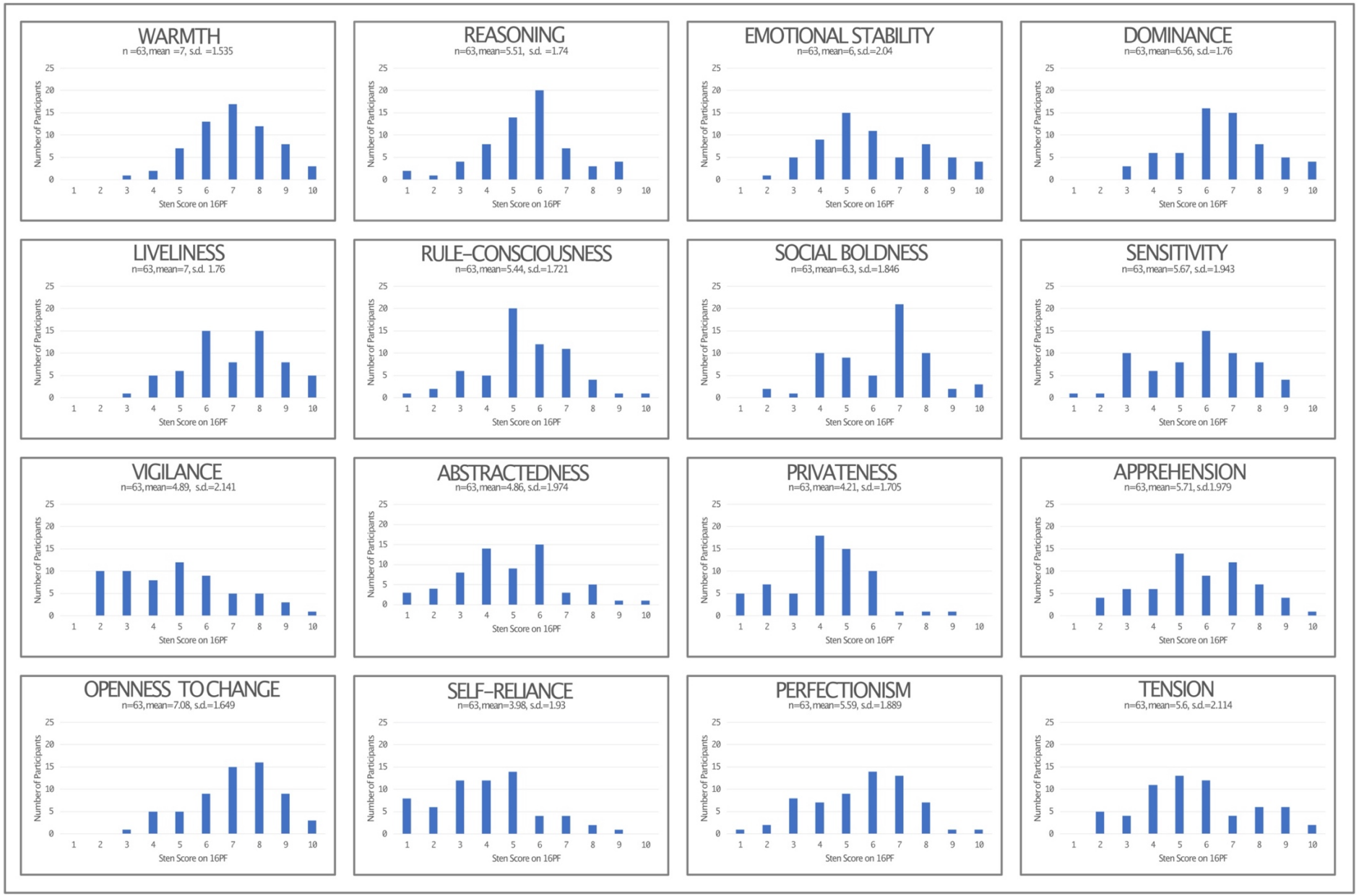


Figure 24. Distribution of STEN Scores on the 16PF assessment for all participants (n=63).

The next step in the analysis was to explore for differences in predominant personality traits between those working in critical care and those working in the emergency department. A comparison of means for each trait of those working between the emergency department and critical care was performed using an independent t test (Table 16). When analysed according to the clinical department an individual participant worked in some differences in the personality profiles of each group were demonstrated.

A statistically significant difference in means was seen for three primary factors. Participants from the emergency department demonstrated higher scores for both "*dominance"* and "*emotional stability"*, (p = 0.017 and 0.026 respectively), and significantly lower scores for *"apprehension"* (p = 0.024).

Table 16. Statistical Analysis of 16PF traits – Emergency Department vs Critical Care.

Primary Factor	**t**	**df**	**Sig (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence**	
						Lower	**Upper**
Warmth	-0.686	61	0.495	-0.279	0.407	-1.094	0.535
Reasoning	1.192	61	0.238	0.547	0.458	-0.37	1.463
Emotional Stability	2.275	61	**0.026***	1.187	0.522	0.144	2.231
Dominance	2.454	61	**0.017***	1.102	0.449	0.204	2
Liveliness	0.598	61	0.552	0.279	0.468	-0.655	1.214
Rule-Consciousness	-1.357	61	0.18	-0.613	0.452	-1.516	0.29
Social Boldness	0.91	61	0.366	0.445	0.489	-0.532	1.421
Sensitivity	-0.496	61	0.622	-0.256	0.517	-1.289	0.777
Vigilance	-0.932	61	0.355	-0.528	0.566	-1.66	0.605
Abstractedness	-1.893	61	0.063	-0.968	0.511	-1.99	0.055
Privateness	-0.083	61	0.934	-0.038	0.454	-0.946	0.871
Apprehensiveness	-2.309	61	**0.024***	-1.167	0.506	-2.179	-0.156
Openness to Change	-0.119	61	0.906	-0.052	0.439	-0.931	0.826
Self – Reliance	-0.497	61	0.621	-0.255	0.513	-1.281	0.771
Perfectionism	-0.267	61	0.791	-0.134	0.503	-1.14	0.872
Tension	0.215	61	0.831	0.121	0.563	-1.005	1.247

Participant population's 16PF scores were then compared to published population norms. Data in Cattell's 1970 16PF handbook (133) provides the mean STENs for each primary factor (excluding "*reasoning"*). Raw data or other aspects of the statistical analysis for each individual participant are not available. As such a statistical analysis to ascertain whether there was a statistically significant difference in means was not possible, however the trends of the different personality profiles can be compared. Comparing the entire participant sample STEN means with the British population sample, a signal demonstrating higher scores

for "*warmth", "emotional stability", "dominance", "liveliness"* and "*openness to change"* can be observed. Interestingly, differences in means can be seen between our study participant group and Cattell's sample of Physicians and Nurses, with notably higher scores for "*warmth", "liveliness"* and *"openness to change".* The STEN profiles for these groups are displayed in Figure 25.

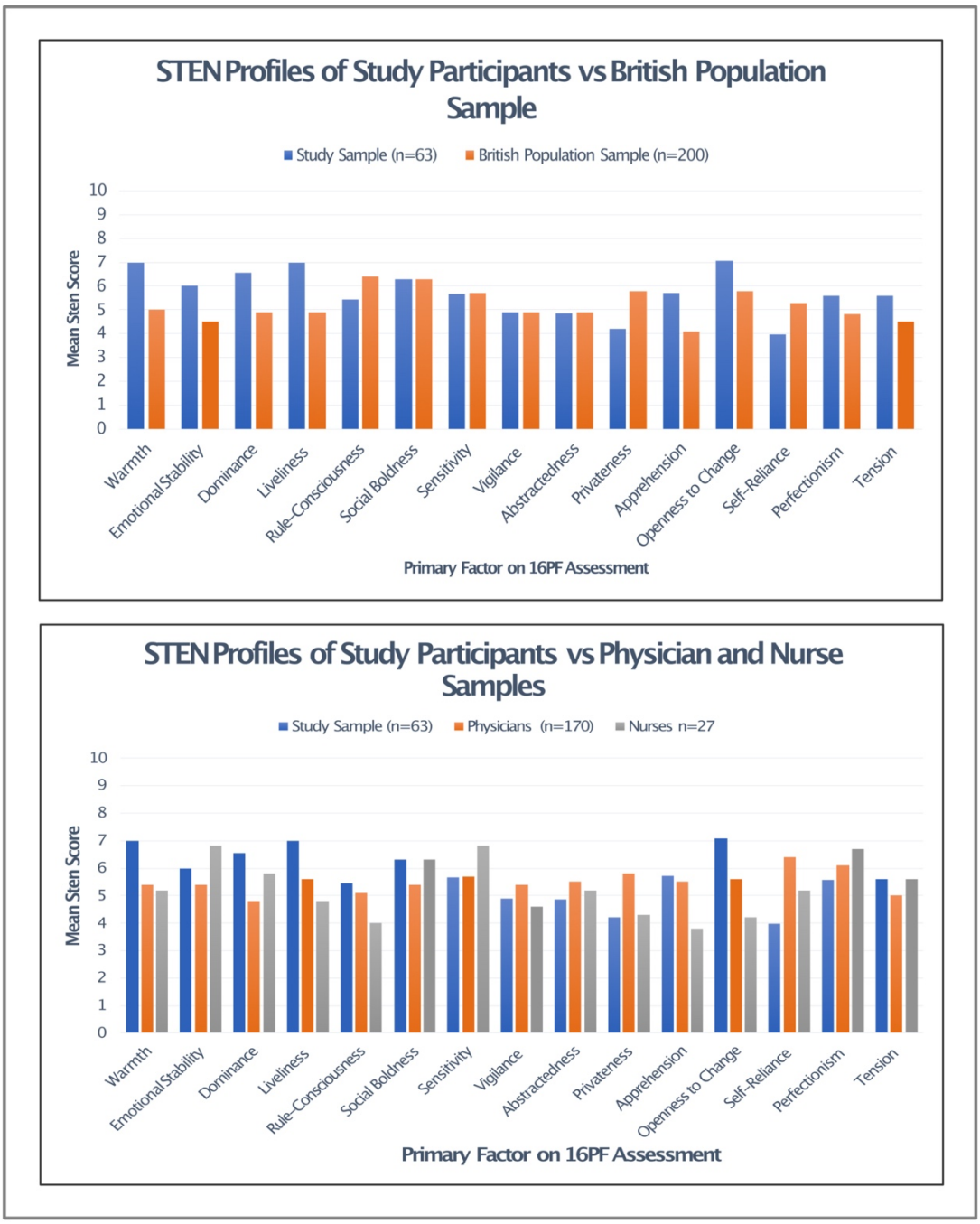


Figure 25. Comparison between mean STEN profiles for our study population and selected populations within Cattell's 16PF Handbook (133).

5.4.2. QUANTITATIVE SURVEY DATA AND RELATIONSHIP TO PERSONALITY

The 58 participants who took part in the qualitative interviews also provided data relating to perceived clinical stressors and psychological safety.

Clinical Stressors

Participants were asked to rank the five identified clinical stressors ("*high workload", "patient expectation", "conflict with colleague'', "beds / resources", "risk of making a mistake".)* according to how stressful they perceived each one to be.

High workload was most frequently ranked as being the most stressful element of working in a clinical environment, with *"patient expectation"* most frequently the least stressful. The breakdown of participant responses are demonstrated in Table 17.

Table 17. Ranking of clinical stressors from most stressful to least stressful (all participants, n=58)

	Clinical Stressor				
Participant Response	**High Workload**	**Patient Expectation**	**Beds / Resources**	**Risk of Making a Mistake**	**Conflict with Colleague**
Most Stressful	22	0	4	12	20
More Stressful	14	6	16	15	7
Stressful	11	12	13	10	11
Less Stressful	6	17	14	12	8
Least Stressful	5	23	11	9	12

When divided according to clinical department, the patterns of responses were similar. There was one notable difference – *"high workload"* was ranked as being "most stressful" more frequently in critical care staff than by those working in the emergency department. The distribution of responses is illustrated in Figure 26.

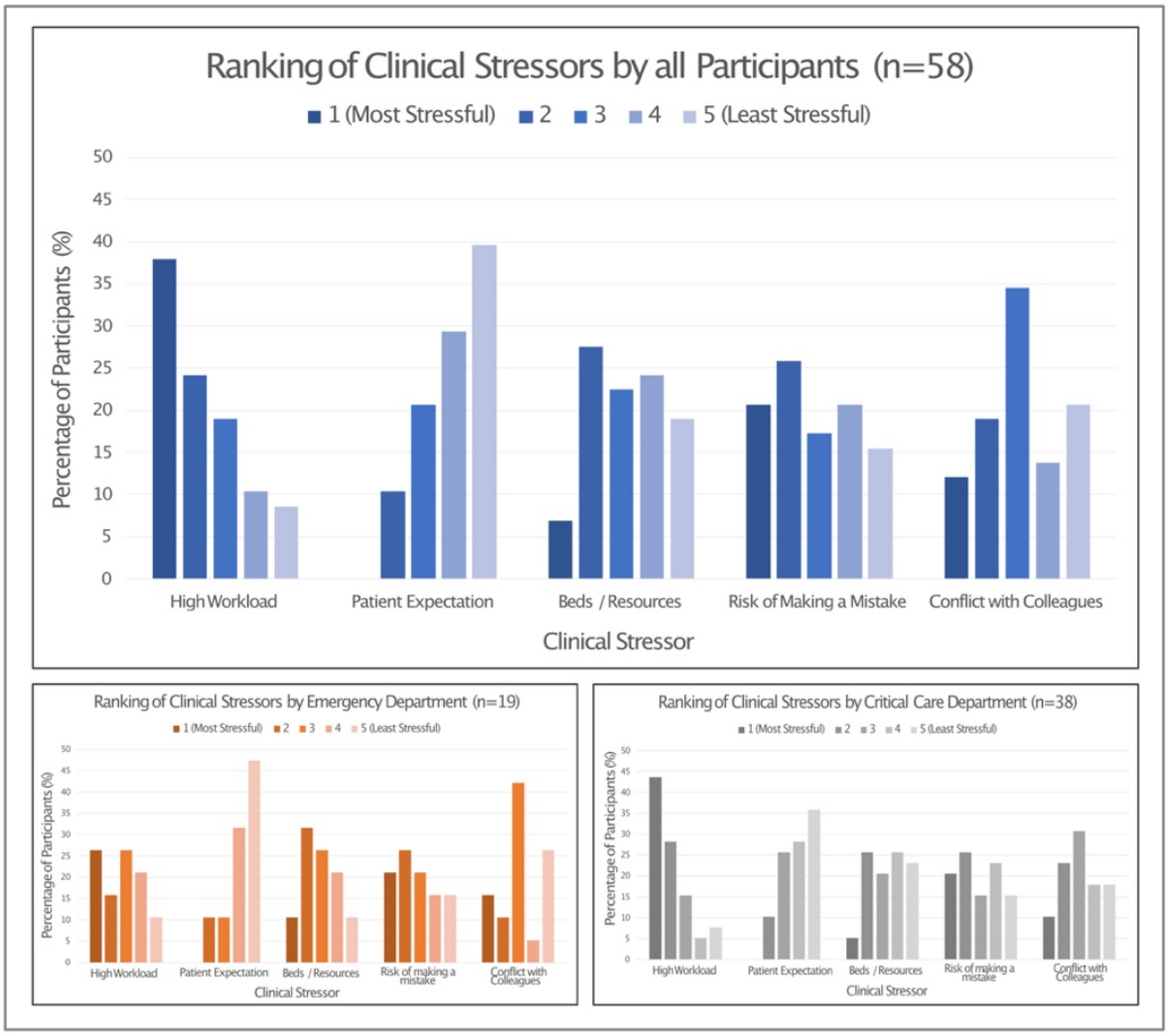


Figure 26. Variations in ranking of clinical stressors when analysed as all participants, emergency department and critical care.

Spearman's Rho was used to determine any correlations between an individual's predominant personality traits (each primary factor on the 16PF assessment) and which clinical stressor they perceived to be the most stressful. For all participants, there were several statistically significant correlations.

Those with high scores for "*emotional stability"* were more likely to rank "*beds/resources"* as being highly stressful (correlation coefficient -0.293, p=0.026); those with high scores for "*apprehension"* were likely to find this factor the least stressful (correlation coefficient 0.272, p=0.0359).

Those with a higher score for "*liveliness"* and "*social boldness"* were more likely to find "*patient expectation"* stressful (correlation coefficient -0.286, p=0.029, correlation coefficient

-0.331, p=0.011). Individuals with higher scores for "*rule-consciousness"* were more likely to find "*conflict with colleagues"* stressful (correlation coefficient -0.263, p=0.046).

Data from this Spearman's Rho analysis can be viewed in Table 18.

Table 18. Spearman's Rho Analysis for Clinical Stressor and 16PF personality traits

		Clinical Stressor				
16PF Primary Factor		High Workload	Patient Expectation	Beds / Resources	Risk of Making a Mistake	Conflict with Colleague
Warmth	Correlation Coefficient	-0.083	-0.043	-0.009	-0.045	0.005
	Sig. (2-tailed)	0.537	0.749	0.947	0.735	0.972
Reasoning	Correlation Coefficient	0.197	-0.069	-0.122	-0.071	0.171
	Sig. (2-tailed)	0.139	0.604	0.363	0.597	0.2
Emotional Stability	Correlation Coefficient	0.206	-0.229	**-0.293***	0.189	0.239
	Sig. (2-tailed)	0.121	0.083	0.026	0.154	0.071
Dominance	Correlation Coefficient	0.119	-0.191	-0.212	0.148	0.123
	Sig. (2-tailed)	0.374	0.15	0.109	0.266	0.36
Liveliness	Correlation Coefficient	0.047	**-0.286***	-0.013	-0.15	0.164
	Sig. (2-tailed)	0.723	0.029	0.922	0.262	0.219
Rule-Consciousness	Correlation Coefficient	0.007	-0.036	0.161	0.121	**-0.263***
	Sig. (2-tailed)	0.96	0.788	0.228	0.366	0.046
Social Boldness	Correlation Coefficient	0.083	**-0.331***	-0.011	-0.108	0.256
	Sig. (2-tailed)	0.535	0.011	0.935	0.421	0.053
Sensitivity	Correlation Coefficient	-0.109	0.016	-0.058	0.088	0.008
	Sig. (2-tailed)	0.415	0.904	0.665	0.512	0.954
Vigilance	Correlation Coefficient	-0.093	-0.006	0.162	-0.138	-0.052
	Sig. (2-tailed)	0.487	0.964	0.226	0.303	0.697
Abstractedness	Correlation Coefficient	-0.16	0.236	-0.09	-0.059	-0.021
	Sig. (2-tailed)	0.231	0.075	0.503	0.661	0.878
Privateness	Correlation Coefficient	0.006	0.078	0.042	0.037	-0.029
	Sig. (2-tailed)	0.965	0.56	0.756	0.783	0.83
Apprehension	Correlation Coefficient	-0.239	0.184	0.272*	-0.185	-0.197
	Sig. (2-tailed)	0.071	0.166	0.039	0.164	0.138
Openness to Change	Correlation Coefficient	-0.045	0.003	-0.22	-0.047	0.055

	Sig. (2-tailed)	0.736	0.983	0.097	0.725	0.681
Self – Reliance	Correlation Coefficient	0.079	0.208	-0.147	0.094	-0.027
	Sig. (2-tailed)	0.557	0.116	0.269	0.485	0.839
Perfectionism	Correlation Coefficient	0.106	-0.045	-0.014	0.155	-0.031
	Sig. (2-tailed)	0.43	0.738	0.914	0.246	0.82
Tension	Correlation Coefficient	-0.005	0.082	0.054	-0.048	-0.074
	Sig. (2-tailed)	0.971	0.541	0.685	0.721	0.582

Psychological Safety

Quantitative data relating to individual participant's psychological safety were available for the 58 individuals who participated in the semi-structured interview. These data predominantly demonstrated the presence of psychological safety in both clinical groups, although some domains highlighted areas for improvement. Eighty-eight percent of all participants agreed that "members of this team are able to bring up problems and tough issues" and disagreed with the statement "is it difficult to ask other members of this team for help". Lower levels of psychological safety were observed when participants were asked "people on this team sometimes reject others for being different", with this eliciting only 67% disagreement. Participant agreement with these seven statements is shown in Figure 27.

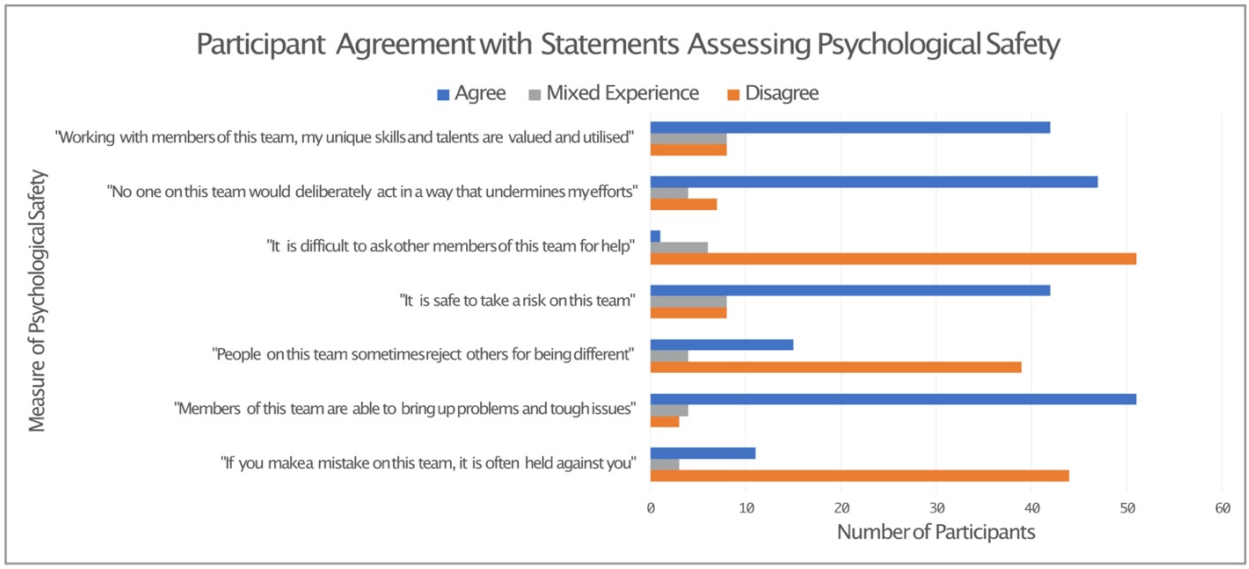


Figure 27. Participant agreement with measures of Psychological Safety (All participants, n=58)

The pattern of responses for this assessment of psychological safety was similar between both clinical departments, with the exception of "People on this team sometimes reject others for

being different". A larger proportion of those working in critical care (33%) agreed with this statement, in comparison to 10% of emergency department staff. The responses according to department can be seen in Figure 28.

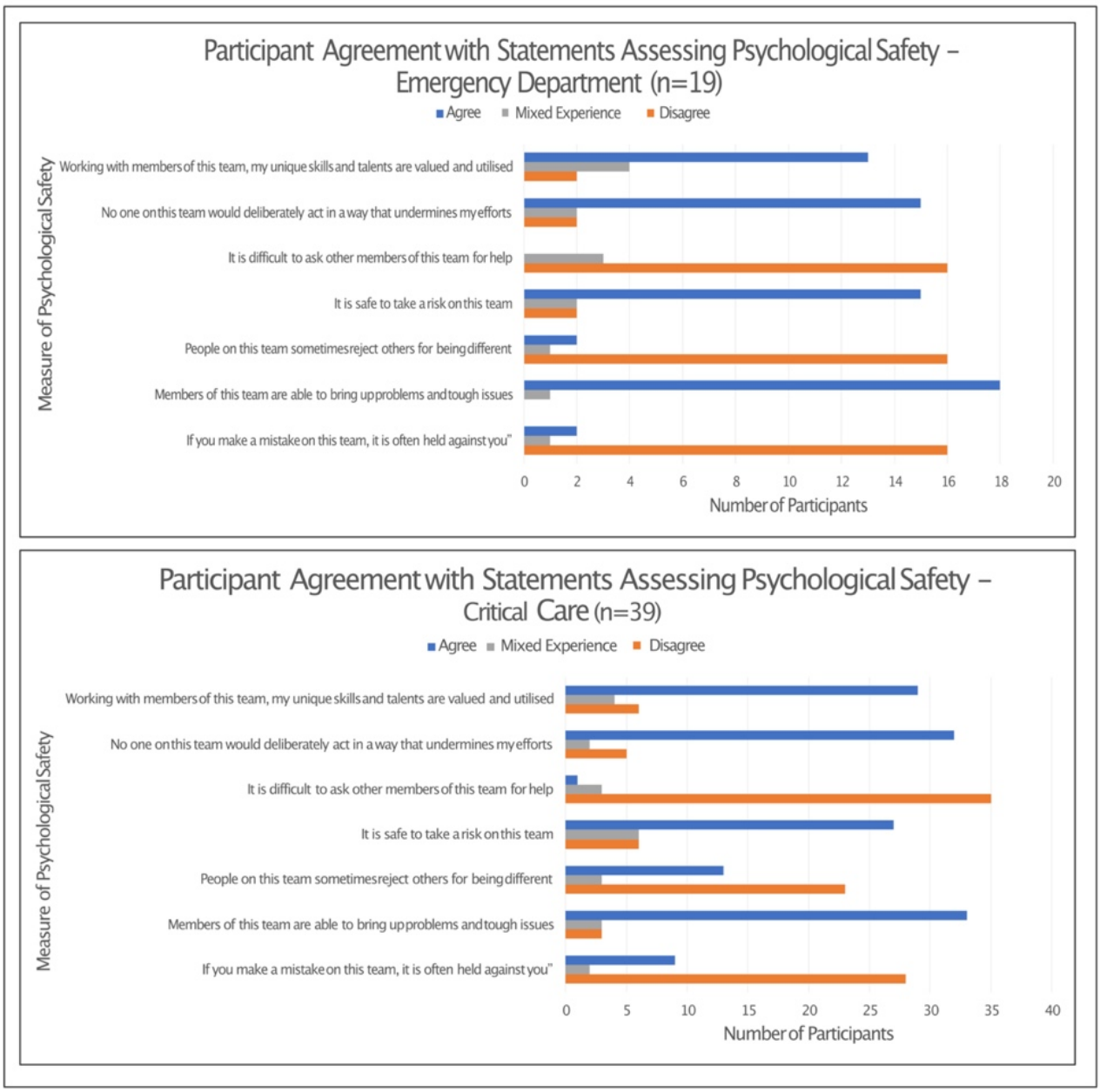


Figure 28. Participant agreement with measures of Psychological Safety according to clinical department.

A Spearman's Rho statistical analysis was performed to assess for the presence of any correlations between an individual's predominant personality traits and their reported psychological safety. A weak positive correlation was seen between "*Emotional Stability"* and "no one on this team would deliberately undermine my efforts" (correlation coefficient 0.272, p=0.039) and, with a weak negative significant correlation between "*Abstractedness"* and

"People on this team sometimes reject others for being different" (correlation coefficient -0.277, p=0.035). The results of this statistical analysis are shown in Table 19.

Table 19. Spearman's Rho Correlation for Psychological safety and 16PF traits.

16PF Primary Factor	**Item on Psychological Safety Assessment** 1. Members of this team are able to bring up problems or tough issues 2. If you make a mistake on this team it is often held against you 3. People on this team sometimes reject others for being different 4. It is safe to take a risk on this team 5. It is difficult to ask other members of this team for help 6. No one on this team would deliberately act in a way that undermines my efforts 7. Working with members of this team, my unique skills and talents are valued and utilised							
		1	2	3	4	5	6	7
Warmth	Correlation Coefficient	0.177	0.052	0.113	0.093	0.05	-0.007	-0.106
	Sig. (2-tailed)	0.184	0.7	0.399	0.487	0.708	0.961	0.430
Reasoning	Correlation Coefficient	0.117	0.078	-0.21	-0.076	0.201	-0.004	0.236
	Sig. (2-tailed)	0.382	0.559	0.114	0.569	0.131	0.978	0.074
Emotional Stability	Correlation Coefficient	0.027	-0.057	0.063	0.154	0.201	**0.272***	0.025
	Sig. (2-tailed)	0.84	0.672	0.638	0.249	0.13	**0.039**	0.853
Dominance	Correlation Coefficient	0.124	-0.183	0.191	-0.1	0.17	0.205	-0.131
	Sig. (2-tailed)	0.352	0.17	0.15	0.456	0.203	0.122	0.327
Liveliness	Correlation Coefficient	0.23	-0.222	0.094	0.16	-0.101	0.072	0.161
	Sig. (2-tailed)	0.082	0.094	0.485	0.23	0.451	0.592	0.226
Rule-Consciousness	Correlation Coefficient	0.034	0.04	0.23	0.012	0.205	0.058	-0.08
	Sig. (2-tailed)	0.798	0.765	0.082	0.928	0.123	0.666	0.549
Social Boldness	Correlation Coefficient	0.15	-0.215	0.116	0.091	-0.047	0.026	0.037
	Sig. (2-tailed)	0.26	0.105	0.385	0.499	0.724	0.845	0.782
Sensitivity	Correlation Coefficient	0.055	-0.13	0.004	0.034	-0.237	-0.037	0.193
	Sig. (2-tailed)	0.684	0.333	0.978	0.798	0.074	0.785	0.146
Vigilance	Correlation Coefficient	0.046	-0.093	-0.042	-0.026	-0.042	-0.049	-0.101
	Sig. (2-tailed)	0.733	0.487	0.757	0.848	0.753	0.718	0.452
Abstractedness	Correlation Coefficient	0.027	-0.111	**-0.277***	-0.002	-0.176	-0.217	0.082
	Sig. (2-tailed)	0.84	0.408	**0.035**	0.987	0.185	0.102	0.54
Privateness	Correlation Coefficient	0.031	0.142	0.069	-0.019	-0.056	-0.019	-0.112
	Sig. (2-tailed)	0.817	0.289	0.605	0.89	0.678	0.889	0.403

Apprehension	Correlation Coefficient	-0.06	0.079	-0.136	-0.059	-0.098	-0.245	-0.028
	Sig. (2-tailed)	0.654	0.556	0.308	0.662	0.465	0.064	0.835
Openness to Change	Correlation Coefficient	0.051	-0.02	-0.016	0.217	-0.057	-0.229	-0.02
	Sig. (2-tailed)	0.703	0.881	0.905	0.101	0.672	0.084	0.88
Self – Reliance	Correlation Coefficient	0.046	-0.018	0.049	-0.018	-0.197	0.054	-0.004
	Sig. (2-tailed)	0.73	0.896	0.714	0.892	0.138	0.689	0.978
Perfectionism	Correlation Coefficient	0.105	0.065	0.021	0.139	0.127	0.216	0.09
	Sig. (2-tailed)	0.432	0.626	0.876	0.297	0.34	0.104	0.499
Tension	Correlation Coefficient	0.048	0.032	-0.123	-0.122	-0.043	-0.247	-0.129
	Sig. (2-tailed)	0.722	0.81	0.359	0.363	0.749	0.062	0.334

5.4.3. QUALITATIVE THEMATIC ANALYSIS

To address the research aims, this analysis had two components. Firstly, a thematic analysis of the entire data set was undertaken to explore the influence of personality, and how this related to stress and psychological safety. This addressed the first three research aims. Once complete, a second analysis of data coded under “negative consequences of psychological safety” was undertaken, addressing the fourth research aim.

Influence of Personality Thematic Analysis

A thematic framework housing three key themes was constructed (Figure 29). These themes were “Teamwork”, “Individual Personality Traits” and “Leadership”.

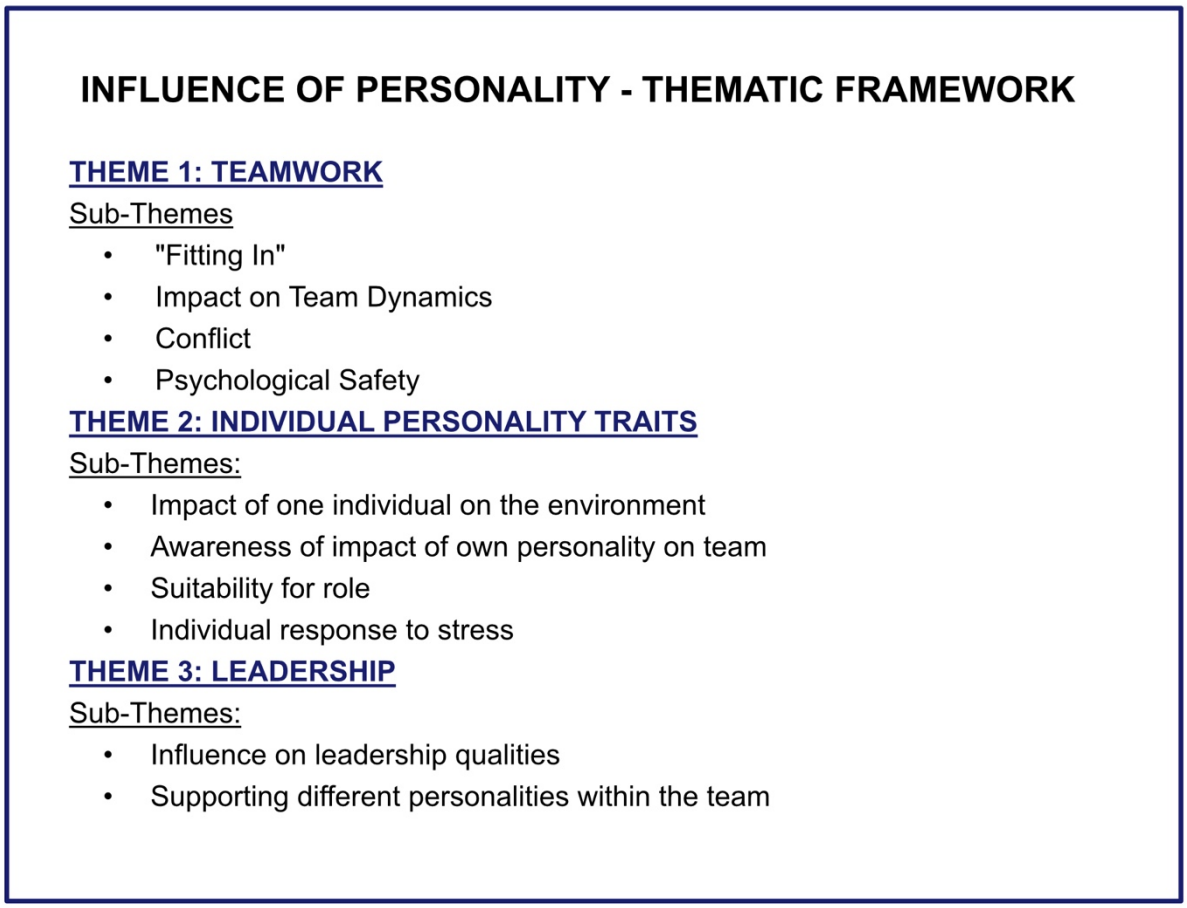


Figure 29. Thematic framework with major themes and subthemes regarding the influence of personality.

Theme 1: Teamwork

Personality, used by participants in a general conversational sense, was felt to have an impact on participant's perception of teamwork in several ways. Subthemes included a feeling of "fitting in", with participants reporting that their personality had an impact on their ability to work cohesively within the established team – with varying reports of their personality being both beneficial and detrimental in this regard.

> *"I think that's a bit of the thing about if you don't fit the mould, then it's harder to fit you into the work environment that everyone else is heading towards" 0035, Consultant, Emergency Department*

The impact of personality on team dynamics was frequently discussed by participants, with a sense that the combination of individual personalities within the team had a significant impact upon the way the team operated, communicated and worked together.

> *"Personalities always affect the teamwork, unless you realise that everyone is very*

different and you accept the fact that everyone is different. Sometimes, people clash, but that's not because anyone wants to clash, it's just because we are different." 0055, Sister, Critical Care

The contribution of personality to the incidence of conflict was discussed as being significant with many participants, with many feeling that personality was a key causative factor.

"But I've had a few tiffs with people, but it's been more personality wise." 0086, Staff Nurse, Critical Care

Participants often agreed that personalities within the team could impact psychological safety. This manifested as being important both in terms of an individual's personality influencing their ability to speak up, but also the personality of those in senior positions who were to be approached.

"I think often it's a choice of who you would go to and that's probably in terms of personality and how you get on with some people." 0042, Junior Doctor, Emergency Department

"I'm not the person who will challenge the senior people… But it depends on the consultant as well, it depends on the personality." 0090, Senior Staff Nurse, Critical Care

<u>Theme 2: Individual Personality Traits</u>

Many participants perceived an individual worker's personality to be significant for the cohesiveness of the team. This was often highlighted when discussing the impact of one individual upon the environment, and generally related to the perceived stress felt by participants. The data demonstrated that some individuals were able to maintain a calm environment as a function of their personality, whilst others would generate a feeling of stress in those around them.

"Anybody who's got a stressed personality I feel can influence outcomes because we all need each other within the facility." 0091, Staff Nurse, Critical Care

It also became apparent that the personality of senior members of staff (notably the consultant or nurse in charge) was perceived to have a significant impact on the atmosphere during the clinical shift.

"Because you sometimes know if you've got one particular consultant in charge or reg in charge, you just know it's going to be a bit more of a stressful day." 0078, Junior Doctor, Emergency Department

"if you've got someone that's calm and like it's going to be fine, you're going to be okay, I'm here if you need anything just let me know, that tends to make them feel instantly relaxed for the shift." 0072, Sister, Critical Care

A similar but distinct subtheme reflected the participant's awareness of how their own personality could impact the working environment. Participants generally viewed it as having a positive effect – reporting that their "inherent calmness" was beneficial.

"And then I definitely noticed I'm normally quite calm. I don't shout at people. I don't tend to get that stressed, and I'm normally quite relaxed." 0072, Sister, Critical Care

Qualitative data also reflected participants self-perceived suitability for their professional role. Participants discussing how their personality helped them in their role generally did so from a positive perspective, reflecting how they enjoyed the type of work – for example thriving in high pressure situations.

"I think that's part of the reason I'm in emergency medicine is, it's not about a long lead in and prepping the surgery or anything like that. You've got to respond to the thing in the moment. And so, if there's something about the ability to handle uncertainty." 0052, Consultant, Emergency Medicine

"I think generally ITU nurses tend to be the type A personality who expects everything to be done to perfection" 0046, Senior Staff Nurse, Critical Care

The data demonstrated how a participant's personality could influence management of stressors. This manifested as observations regarding how others responded to stress – including being risk averse or becoming stressed easily.

"I'm convinced that some people blossom in under stress and are able to reach out and become much more team players. And then others retreat back into command control mode and I think that varies also with your team." 0069, Consultant, Emergency Department

"Yes it is because I see a lot of people worry, and I know that it factors in many people's

lives." 0071, Sister, Critical Care

Theme 3: Leadership

Personality was perceived to influence leadership qualities, with certain observed traits such as calmness or a tendency to collaborate viewed as improving leadership ability.

> *"I've definitely seen examples of beneficial traits. Someone that can place themselves very easily in a position of leadership and authority. If you've got an emergency situation, you do need someone to take the lead and take people's first names. Ask them to do specific jobs. Put people into different roles. Lead the team. I think that's all very beneficial." 0079, Junior Doctor, Critical Care*

Participants who were in leadership positions within their clinical environments conveyed that it was useful to know and understand the personalities of present within the team in order to improve the working environment and be able to support individuals as needed.

> *"because you're such a big group of people you will get personalities that you not necessarily clash with, but you have to be a little bit more patient and diplomatic sometimes." 0080 Staff Nurse, Critical Care*

Further supporting qualitative data for this thematic analysis can be viewed in Appendix 8.

Thematic Analysis – Negative Consequences of Psychological Safety

Qualitative data were identified as relating to potential negative consequences of psychological safety and coded as such. These were reviewed according to a thematic analysis technique, simultaneously reviewing the thematic framework (Figure 30) created for the same topic during the "Attitudes to Safety" study for evidence of similarities (4.4.1.1.4).

This study confirmed some of the themes identified in that analysis and provided further novel concepts and detail. A thematic framework was created during the analysis, with 5 themes (Figure 30). Given the relatively small amount of data within this analysis relating to this topic, these themes were not divided into subthemes.

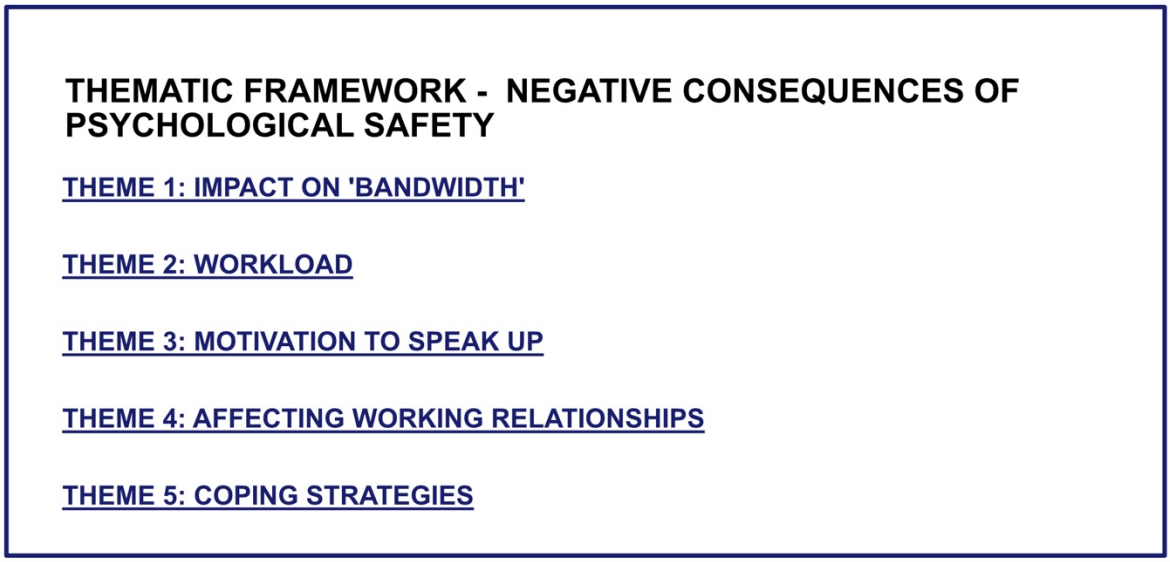


Figure 30. Thematic framework for the negative consequences of psychological safety.

A climate of psychological safety was again reported to have an impact on an individual's "bandwidth", corroborating the prior analysis. Participants similarly highlighted that a climate of psychological safety could lead to feelings of distraction, being mentally overwhelmed and frustrated.

> *"because the ward round is taking so long because people keep interrupting you, someone else just gets fed up waiting for you to come round and they interrupt you and stuff. So, the interruptions are very distracting, rather than necessarily what they're interrupting you with, if you know what I mean. It's just the actual thought process being interrupted, regardless of the cause." Consultant, Critical Care, 0077*

Another corresponding theme was the sense that the freedom to speak, (facilitated by a climate of psychological safety) led to an increased workload. This was generally a consequence of time being taken for discussion as a result of ideas being raised, or staff wishing to discuss other matters.

> *"I think there's got to be order and a time to do it. So, for instance, the ward round always has the potential to become this thing that goes on forever, loses its purpose." Physiotherapist, Critical Care, 0075*

Participants also corroborated the finding that a climate of psychological safety facilitated speaking up that was driven by motivations other than patient safety or innovation. Several examples of this were given, including trying to avoid blame for mistakes, ensure their voice was heard or to cause problems within the team.

"But obtuseness is the most difficult because if somebody asks you a question and you're not sure why they're doing it, I think that's really hard." Consultant, Emergency Department, 0069

The analysis also yielded a new potential negative consequence of psychological safety – that it could facilitate comments and opinions that were detrimental to working relationships (and even leading to conflict).

"I think it's great that we're all a bit more able to have dialogues with people, but I think it just makes things quite difficult sometimes." Consultant, Emergency Department 0036

The discussion regarding potential negative consequences to psychological safety led to the creation of the 5th theme within the framework, another novel topic. Participants discussed mechanisms they had (or would) use to employ strategies to manage potential negative consequences. These included clear delegation, finding alternative times for more open discussions, and educating the team.

"You have to deflect sometimes. I often say to people just put it in an email because I'll forget what you told me. And just try and prioritise clinical concerns and questions for that particular shift" Consultant, Emergency Medicine, 0038

Further supporting qualitative data can be viewed in Appendix 9.

5.5. DISCUSSION – INFLUENCE OF PERSONALITY

The influence of personality has been explored previously in healthcare workers, but this has been limited, (1.1.6.3) and typically investigates correlations between personality traits and performance (150, 152-155, 164, 328). These are quantitative studies, and do not assess how personality can influence stress, team dynamics and the working environment. An ethnographic study explored the impact of team dynamics and culture and decision making in surgical teams, but personality did not feature in this analysis (329).

Correlations between personality and psychological safety have previously been explored to a limited degree, however do not have healthcare workers as the predominant participant group. A recent study of miners in Ghana reported that individuals with more "resilient" personalities were naturally more psychologically safe than their counterparts (330). Another

study in miners showed that resilient personality traits (such as emotional stability) would positively predict psychological safety (331). Other studies have explored how psychological safety can be a moderator in the relationship between proactive personalities and job satisfaction (332), but do not explore the explicit relationship between personality and psychological safety itself.

By combining quantitative measures of personality and psychological safety with a qualitative analysis, the data in this study have allowed a detailed insight into the influence of personality on psychological safety and workplace dynamics in the healthcare environment to be obtained.

Personality profiles

Participants in this study showed a predominance for mid-range scores across most traits assessed. This is likely to be beneficial for those working in healthcare, allowing them to adapt to the wide-ranging and time-sensitive challenges faced. There are often scenarios where staff are required to operate outside protocols and policies to provide the best possible care for patients – this is generally as a consequence of under-resourced environments.

For "*rule-consciousness",* the majority of participants scored 5, meaning a "tendency to accept imposed rules and regulations, but not to do so rigidly, at times turning to what is convenient or practical" (133, 333). It is easy to see how this could be beneficial within the healthcare setting, with staff preferring to follow protocols and pathways as their default mode of behaviour but adapting as needed in the face of resource challenges or emergency situations. However, whilst beneficial for service delivery, this constant requirement for adaptation may cause added stress and dissonance for some individuals, particularly those with higher scores for this trait.

A large proportion of participants had low scores (<3) for "*vigilance".* This trait relates to the "extent to which people will be wary of and mistrust others", with low scoring individuals "likely to be tolerant and expect fair treatment from others"(333). Given the need to trust patients, colleagues and those in more senior roles within the organisation (often very rapidly and with minimal information), it is not surprising that low scores for this trait predominate in both our study sample and the participant sample within the preliminary study.

This study addressed the hypothesis that there would be identifiable differences in the personalities of those working in critical care in comparison to those working in the emergency department. The data demonstrate a clear signal that there are differences in predominant personality traits between those working in the emergency department and those in the critical care environment. Those in the emergency department had higher scores for "*dominance"* ("the extent to which the individual wishes to exert an influence on the views, opinions and actions of others"(333)) and *"emotional stability"* ("how calmly a person tends to adapt to the demands life makes upon them" (333)). They also demonstrated lower scores for *"apprehension"* ("the tendency of individuals to worry about their personal adequacy and blame themselves when things go wrong" (333)) . The emergency department is an extremely dynamic environment with rapidly changing requirements for those working within it and the behaviours associated with these traits may be beneficial.

The sample of study participants showed evidence of differences in mean STEN scores for several personality traits when compared to those published within Cattell's 1970 handbook (133). Whilst these groups are not directly comparable, both in terms of environment or professional role, it suggests that those working in acute care environments may have different predominant personality traits in comparison to the general population. This supports the second hypothesis in this study – that individuals working in healthcare environment have distinct personality profiles when compared to general population samples. There is scope to explore this further, both in terms of whether these predominant traits confer suitability for their role, and whether these differences are present in when comparing other medical specialties. It is also worth acknowledging that Cattell's handbook was published in 1970, and the nature of the work done by professional groups is likely to have changed. A repeat study would benefit from using contemporaneous comparator population groups.

Clinical Stressors

High workload was ranked “most stressful” proportionally more in critical care staff, possibly as a reflection of expectation. Critical care staff often work in “closed” units, and therefore have an element of control as to who is admitted to the unit and the timescale in which they are admitted. This is in stark comparison to the emergency department where there is expected to be a constant influx of patients, and staff have no control over the timings or nature of these presentations. The third hypothesis predicted a relationship between an individual’s predominant personality traits and the clinical situations they perceive as extremely stressful. Five personality traits on the 16PF questionnaire significantly correlated with how participants ranked the list of clinical stressors, and consequently which factors participants found particularly stressful. Whilst these data provide only a signal of how personality can influence an individual’s perception of their working environment, it is useful to acknowledge this. If team leaders can understand the range of personalities within the team, predicting scenarios when they will experience high levels of stress may facilitate more nuanced leadership and increased support where needed.

Psychological Safety

Predominantly high levels of psychological safety were demonstrated within the participant group, but again with some room for improvement. The overall impression of a climate of psychological safety allowed for exploration into how this phenomenon could be influenced by an individual’s personality. The correlation of some personality traits with high scores on certain aspects of the psychological safety assessment may suggest that the construction of a psychologically safe environment is influenced by the personalities of individual team members, supporting the fourth hypothesis. This corroborates Edmondson’s paper suggesting that personality impacts a climate of psychological safety (34).

Psychological safety manifested in different ways between the two departments, demonstrating how factors specific to each workplace environment can promote (or inhibit) its occurrence.

Qualitative Analysis

The thematic framework highlights how the personalities of individuals working together during a shift can combine to create a calm or a stressful environment in the face of similar

clinical stressors. It also identifies that there are key individuals working within the clinical environment, namely those in leadership positions within nursing and medicine whose personality can have a significant impact on the working environment. The benefits of a "calm leader" was a very strong theme within the data, viewed as being a very positive attribute by participants. Understanding that personality is influential in the creation of a good working environment and cohesive teamwork is a positive argument for creating teams that have aligned personality traits, or at the very least understanding the personalities present within the team and using this information to improve team cohesiveness.

Implications for the workforce

Triangulation of the qualitative and quantitative data collected in this study demonstrate evidence of subtle differences in predominant personality types within the clinical workforce, both within teams and across clinical departments. This process also provided valuable insights into the potential impact of personality on cohesive team working, the perception of stress and the creation of an environment of psychological safety.

It is possible to extrapolate from this that selecting for roles within clinical departments may be beneficially assisted using personality assessment tools (both in terms of individual suitability and team cohesiveness). However, given the pressures on the service delivered by the NHS and the continuing staff shortages, departments do not have the luxury of being able to select individuals according to personality type. In addition, performing personality assessments with in-depth candidate feedback requires significant resources including finance, expertise in administering the assessments and time for each participant to undertake the assessment itself. It is also worth considering that heterogeneity of personality within the clinical workforce is likely to be beneficial for clinical outcomes and patient safety, given the potential complexity of clinical medicine. Individuals with different personalities may react in different ways to organisational challenges, possibly providing an increased opportunity for problem solving and ingenuity. However, whilst this heterogeneity may be useful, the consequences for the individual if they are particularly vulnerable to stress or mismatched in their place or team of work must also be considered. If these "at risk" individuals can be identified it may be possible to provide increased support for them in

certain challenging scenarios, with the intention of minimising stress, improving job satisfaction and reducing the risk of burnout.

Another application of personality assessments may be for team leaders to use them to "get to know" their team, particularly each individual's potential strengths and weaknesses. As an individual's personality data and predominant traits are unlikely significantly to change over time an individual's personality report can be used as part of ongoing review, particularly in times of challenge to assist in identifying coping strategies and possible reasons for behaviours and responses.

Negative Consequences of Psychological Safety

A further small thematic analysis was performed on qualitative data relating to the negative consequences of psychological safety. This thematic analysis again highlighted that an individual's "bandwidth" can be filled by repeated instances of "speaking up" leading to negative psychological consequences for the individual and risking patient safety. Interestingly, a new theme regarding strategies to mitigate such negative consequences was constructed. These coping strategies particularly addressed the issue of an "overloaded bandwidth", with participants suggesting solutions to keep discussions focused, putting aside alternative times and locations for other concerns to be raised. Another novel finding was that a psychologically safe environment that allowed individuals to speak freely could be detrimental to working relationships, even leading to the creation of conflict.

Both participant sub-groups discussed the potential for these negative consequences, lending support to the idea that the manifestation of these effects is not limited to critical care. As such the concepts in this analysis may be generalisable to other healthcare settings.

5.5.1. STUDY LIMITATIONS

There are several limitations within this study. Whilst proportional to the size of the departments, the number of participants from the emergency department is smaller than the participant group from critical care, which may impact the strength of conclusions drawn. If this study were to be repeated it may be beneficial to cap the number of critical care

participants to match the size of the participant group from the emergency department (although in turn this may affect the quality of the purposive sampling technique for the critical care group).

There is a risk of participation bias in this study, as those disproportionately affected by stress within the workplace may have been more inclined to participate in this study. In addition, those with an interest in personality theory or a desire to know their own personality data may have been more likely to participate (although this desire is unlikely to have had a significant impact on the study findings).

Within the qualitative data, participants have used the term “personality” in the ordinary conversational sense, rather than according to a strict definition. This must be considered when analysing the data, as references to personality may reflect behaviours rather than defined personality traits.

The statistical analysis performed on quantitative data within the study highlighted some significant correlations between survey and personality traits. However, the large number of variables analysed within each calculation must be considered, as this will increase the likelihood of a statistically significant result occurring by chance.

This study was designed to be exploratory, building on preliminary work regarding the influence of personality in healthcare professionals. As such it was not powered to detect statistically significant differences in personality between the two participant groups, and was not designed to be generalisable across other similar professional groups. This study provides an solid base from which to design future studies with quantitative elements. These would require appropriate power to further evaluate the presence of statistically significant personality differences in clinical staff working in different specialties, and across different working environments. The qualitative data in this study achieved thematic saturation, providing confidence that the conclusions drawn from these data reflect the perceptions of the participant group. Again, the thematic frameworks could be used deductively in similar professional groups to build support for the conclusions made regarding the influence of personality and enhance their generalisability across all NHS staff.

5.6. RESULTS – LIVED EXPERIENCES OF HEALTHCARE WORKERS ON THE FRONTLINE OF THE COVID-19 PANDEMIC

5.6.1. RATIONALE FOR PERFORMING ANALYSIS

It was noted during qualitative interviews and subsequent analyses that that adaptations, stresses and consequences of working during the first wave of the COVID-19 pandemic were prominent themes. Given the quality and volume of data relating to the impact of the pandemic on staff, it was determined that a dedicated thematic analysis exploring these data would be appropriate. These qualitative data tell a story regarding the lived experience of those working in the first wave of the COVID-19 pandemic, with particular emphasis on perceived stressors and the presence of psychological distress.[10]

Published studies investigating psychological distress in healthcare workers during and after pandemics are predominantly quantitative, utilising psychological assessment tools such as the Impact of Event Scale (335) or the Depression, Anxiety and Stress Scale (DASS-21). (336) Psychological distress (typically manifesting as anxiety, depression or post-traumatic stress disorder (PTSD)) has been shown to be prevalent in healthcare workers during and after a pandemic, (103, 337-342) with studies highlighting a range of contributory factors. There is concordance in the findings of many of these studies – female staff, nursing and younger team members appear to be at highest risk (337, 343-346); social isolation, fear of infection and limited resources all contribute to the development of psychological distress. (106, 334)

A rapid systematic review of 55 studies (105) (38 of which focused upon the COVID-19 pandemic) explored the psychological impact on healthcare workers facing epidemics or pandemics and concluded that fear of the unknown or being infected was paramount. Other prevailing issues include a heightened state of vigilance, (347) as well as the impact of physical symptoms caused by long hours in personal protective equipment (PPE). Resource rationing, resuscitation decisions and remote communications with relatives are also implicated. (348) In addition, fears about availability of PPE and mistrust in frequently changing policies have

[10] This paper has been accepted for publication in BMJ Open as Open Access under a Creative Commons Licence (CC-BY-NC 4.0). Permission to use and adapt data within the article has been given by all authors.

334. Grailey K, Lound A, Brett S. Lived experiences of healthcare workers on the front line during the COVID-19 pandemic: a qualitative interview study. BMJ Open. 2021;11(12):e053680.

Contributor Statement: KG and SJB conceptualised and designed this study. KG and SJB were involved with the recruitment of participants. KG was responsible for data collection, data processing and overall data analysis. AL assisted with data analysis. KG, AL and SJB reviewed the data and coding discrepancies in line with qualitative research techniques. KG prepared the original draft manuscript. KG, AL and SJB all critically revised the manuscript. All three authors approved the final version of the manuscript.

been reported, (104, 349, 350) highlighting the requirement for open and transparent communication (351). Working in a pandemic adds an extraordinary level of stress to what is already known to be a stressful working environment, (82) making the requirement for psychological safety, cohesive teamwork and effective communication even more important. This is particularly challenging in the context of staff redeployment (typically moving staff from non-specialist or outpatient areas to work in high acuity COVID-19 areas) and the use of PPE (334).

5.6.1.1. Reflexivity

The study group were aware of how their own position may affect the analysis and interpretation of the findings, particularly in the context of their own experiences of working during the pandemic. In particular, KG and SJB had first-hand experience of working in critical care during the first wave. The study team believed that working during the COVID-19 pandemic was likely to impact on perceived stressors and teamwork although possessed no preconceived ideas regarding the nature of this impact or how this would manifest. The team maintained a reflexive position throughout the analysis to minimise the risk that any presumptions would affect the analysis and interpretation of the study findings (334).

5.6.2. THEMATIC ANALYSIS

Of the 58 participants recruited to this study, 49 were interviewed after the first wave of the pandemic had subsided. These interviews were all conducted virtually via the Microsoft Teams Platform.

The duration of these 49 interviews ranged from 12 to 31 minutes with an average duration of 21 minutes. Thirty-nine of the participants in this subgroup were Critical Care staff, with 10 recruited from the Emergency Department. This disparity in proportion of participants from each clinical area is a function of those interviewed during the “post first wave” period. All levels of seniority and the multidisciplinary team are represented in this sub-group of 49 participants, although again there is a smaller proportion of emergency department nurses as most of this professional group were recruited and interviewed prior to the onset of the pandemic.

Interviews were scheduled for as close to the end of the first wave as possible, with the majority of participants being interviewed in the 3 months immediately following the first wave (19 in July, 6 in August and 10 in September). The remaining 14 interviews took place within a 6-month period (9 in October, 4 in November and 1 in December).

A thematic framework housing five main themes that summarised the lived experiences of participants working on the frontline of the COVID-19 pandemic was constructed (Figure 31).

Major Themes and Sub-themes Summarising Healthcare Workers Experiences of Working During the COVID-19 Pandemic (First Wave)

THEME 1: PSYCHOLOGICAL EFFECTS

Sub-Themes

- Presence of Psychological Distress
- Fear of COVID-19
- Feelings of Isolation
- Indicators of Moral Injury
- Related to supporting others in their psychological distress
- As a function of the 'unknown' nature of the pandemic
- Evidence of Coping Strategies
- Differences in individual Strategies
- End of first wave and return to 'normal'

THEME 2: CHANGES IN TEAM DYNAMICS

Sub-Themes:

- Flattening of hierarchy, or changes in presence of hierarchy
- Morale and Camaraderie
- Changes in relationships and breaking down barriers
- Influenced by having COVID-19 as a shared experience
- Improvement in team dynamics during and following first wave
- Incorporation of redeployed staff
- Changes in support (both received and ability to provide)
- Breakdown in teamwork during and following first wave
- Changes in Nursing Autonomy
- Changes in Responsibility

THEME 3: CHANGES IN PSYCHOLOGICAL SAFETY

Sub-Themes:

- Improved by the 'unknown'
- Empowerment / Improved Psychological Safety as a consequence of COVID-19
- Lack of Psychological Safety / New Barriers to Psychological Safety created by COVID-19

THEME 4: IMPACT OF PERSONAL PROTECTIVE EQUIPMENT

Sub-Themes:

- Difficulties in Communication
- Physical Difficulties and the impact of wearing PPE
- Shortages of PPE
- Barriers caused by a lack of presence or visibility, impact on teamwork and cohesiveness

THEME 5: CHANGES IN WORKPLACE STRESSORS

Sub-Themes:

- Impact of COVID-19 on workload and working environment
- Caused by frequent changes in policy and protocols to manage COVID-19

Figure 31. Thematic Framework highlighting major themes and sub-themes constructed during the thematic analysis (334).

10% (6) of transcripts were analysed by a second researcher (AL) and a coding comparison query was performed within NVivo (R1). Eighty-eight codes were created for themes relating to COVID-19 during the thematic analysis. Across these the percentage agreement ranged

between 92.45% and 100%. A Kappa coefficient of between 0.4-0.75 (fair to good agreement) was seen in 14 codes, and >0.75 (excellent agreement) in 17. Discrepancies in coding were resolved through discussion within the research team.

Theme 1: Psychological Effects

New psychological distress (defined as a change in emotional status, perceived inability to cope effectively and discomfort (352)) arising as a consequence of the pandemic was reported by a high proportion of participants. Participants self-reported feelings of "burnout" (a phrase used colloquially by many participants, rather than referring to a measured assessment) and mental exhaustion, in addition to low mood, feelings of anxiety and being visibly upset. Participants also described observing psychological distress in their colleagues. Evidence of psychological distress persisted for the duration of the overall data collection, still being described in those interviewed several months after the first wave (334).

> *"Everyone was so negative and people were going for their break and just cry. I did that many times. It was just too much stress." Staff Nurse, Critical Care*

> *"but they're just burnt out. They're on the floor, they're just exhausted." Senior Staff Nurse, Critical Care*

> *"Absolutely, yes. Tiring, burnout and completely mentally devastated" Physiotherapist, Critical Care*

Psychological distress also resulted from fear of COVID-19 itself (either for participants themselves or their family members), with participants feeling vulnerable and anxious about their own risk. This was particularly evident in those interviewed closer to the end of the first wave (334).

> *"it was very much felt that the people who were going in could potentially be in harm's way" Senior Staff Nurse, Critical Care*

> *"And handling pressures and concerns for their loved ones at home whether that's here, elsewhere." Consultant, Emergency Medicine*

> *"So, I think things that made it more stressful were, often, on intensive care, perhaps a protective mechanism, you can rationalise why you are not going to be in that critically ill situation. As in, I don't know, I don't smoke or I'm not old enough to have the disease you're in with or whatever. Yet, although it was biased towards a certain population group, there was still a lot of doubt how at risk we were." Physiotherapist, Critical Care*

There was evidence of psychological distress from participants feeling isolated – either as an individual (often due to short staffing and high workload) or as a department – struggling to get support from other clinical divisions.

> *"Honestly, what it felt like was A&E versus the world." Senior Sister, Emergency Department*

> *"When we were still upstairs [in a temporary 'surge' unit], you were just stuck basically. Even if you needed some help, you would have to wait." Staff Nurse, Critical Care*

Evidence of moral injury (defined as "*the profound psychological distress resulting from actions which violate an individual's moral or ethical code*" (108, 109, 111), see Chapter 1.7.3) was present as a strong theme within the data set, particularly in those interviewed immediately following the first wave. This appeared to be typically related to being unable to complete tasks adequately or provide a standard of care seen as essential prior to the pandemic. Of note this appeared to be more prevalent in interviews with more senior staff (334).

> *"There were days I didn't even turn my patient once. That's awful. That was disgusting. We all just thought if each of these patients could have one to one care, they would probably do a lot better than they would cohorted and not looked after in the proper way." Staff Nurse, Critical Care*

> *"We did absolutely the best that we could possibly do, but it just in no way, shape or form was good enough. But we did what we could in the confines of our environment" Staff Nurse, Emergency Department*

> *"but each week I come away feeling I failed again, so it's hard," Senior Staff Nurse, Critical Care*

> *"I definitely remember a day when I was in one of the bays and there was just a lot going on. And then I felt incredibly overwhelmed and I just remember wanting to get out of there as soon as possible. I was there to relieve everybody else." Senior Staff Nurse, Critical Care*

Senior staff members also described the psychological impact of supporting other team members – describing a sense of "taking on others" psychological distress (334).

> *"So, I guess that is sometimes difficult, you obviously had to listen to people, and we were very worried about staff burnout and staff stress, but we really did still have so much work we had to do, with much more spread out staff than what we usually would have." Senior Physiotherapist, Critical Care*

> *"I was becoming increasingly stressed and anxious and worried about all the staff that were clearly worried about getting COVID themselves, or their families. Or they've had to move into a hotel and can't see their children, those kinds of concerns as well as work" Senior Sister, Critical Care*

The “unknown” nature of the pandemic – (both in relation to the disease process and the likely duration) was a substantial cause of distress for participants, both in terms of fearing they were unable to adequately treat their patients and due to a lack of prior experience (334).

> *I noticed, some of my colleagues had so many difficulties just dealing with the new things” Staff Nurse Critical Care*
>
> *“We didn’t really know what was going to happen either. I think it was difficult and stressful for everyone.” Senior Staff Nurse, Critical Care*
>
> *“I think it was, most of all, not knowing what was happening, not knowing how to make a patient better.” Staff Nurse Critical Care*

There was demonstrable evidence of participants using coping strategies to help manage the impact of the pandemic. These included having a focus upon the fact that it would end at some point, acknowledging that not everything could be done in such a scenario or trying to improve the atmosphere and mood of those around them (334).

> *“I knew that at some point it finishes. And that got me through and kept me quite calm through it. I was very calm through it.” Senior Staff Nurse, Emergency Department*
>
> *“I can’t control this, this isn’t what I would have chosen, but then what can I control? I can control deciding to make this work.” Staff Nurse Critical Care*
>
> *“It’s always nice to be able to just smile. I tried as much as possible to insert a smile and just keep people going as much as we could, as did thousands literally.” Staff Nurse Critical Care*

There were also data to support a sub-theme that individuals employed different coping strategies when handling the psychological challenges of the pandemic. Some participants noted that their normal way of interacting with others changed, or that their experience of stress was different to other staff members, reporting being calmer than how they observed others behaving around them (334).

> *“I think different people responded differently. And I think again, stress really changed that” Staff Nurse, Critical Care*
>
> *“I was very calm through it” Senior Sister, Critical Care*
>
> *“So those are few people that were noticeably very stressed, and then other people would get stressed around them. And normally I’m the opposite and it’s okay, but there were parts when I’d get a bit like that.” Senior Sister, Critical Care*

There was evidence of a change in the psychology of individuals transitioning from working within the first wave of the pandemic to a more "normal" way of working. There was heterogeneity in the responses of participants to this change. Some reported disappointment at the loss of the new cohesive team structure, whilst others conveyed a realisation of just how exhausted they were and relief that it was over (many of the interviews took place before widespread awareness of the likely possibility of a second wave of COVID-19 in the U.K.).

> *"I was so sad when actually we had to split up and go back to our normal jobs." Junior Physiotherapist, Critical Care*

> *"Afterwards, it hit you like a tonne of bricks after, especially even after a shift sometimes. When you're in it, you're in it. You don't have the time to reflect on how you're feeling. But afterwards, you're like, whoa." Staff Nurse, Critical Care*

> *"Yes, it has, and it's nice. Everyone's definitely happier at the moment" Senior Staff Nurse, Critical Care*

Theme 2: Changes in Team Dynamics

Again, there was marked heterogeneity in participant's experiences when describing the impact of the COVID-19 pandemic on team dynamics. This led to the generation of divergent subthemes encompassing both positive and negative effects. Participants generally reported observing mixed effects on changes in team dynamics, highlighting both positive and negative changes, rather than describing purely positive or negative experiences.

Participants were asked to discuss teamwork in line with the original study objectives and this often led to discussions regarding the presence of a hierarchy. Resulting data suggested that any prior hierarchy flattened during the pandemic – this was a prominent theme within those interviewed straight after the first wave. This flattening was viewed positively, with the unknown nature of the pathology associated with COVID-19 making it easier to discuss and work openly with more senior members of the team as those in senior positions did not possess unique insights based upon prior experience (334).

> *"It's always been pretty easy, but the fact that nobody knew much about it, surely flattened the differences between the senior staff and the junior staff." Staff Nurse Critical Care*

> *"I think that, yes, there definitely was on the ground quite a flattening and a flattening between professions" Staff Nurse Critical Care*

"So, I think in that case, it probably did, and I think everybody, regardless of their banding and their grade, were happy to do whatever. So, I think it probably did flatten from that point of view, yes." Senior Physiotherapist, Critical Care

There was a compelling presence of increased staff morale and camaraderie within this data subset, as teams came together to deal with the challenges the pandemic posed. This was particularly represented in those interviewed early in the study timeframe (334).

"But I saw at first-hand what was going on and it was brilliant, they were working more than a team, we were like a family and people just got on with it." Senior Sister, Critical Care

"I think the relationships, generally, was very good. I think, maybe, it's heightened it, if anything, and I think the camaraderie was amazing, between the MDT." Senior Physiotherapist, Critical Care

"I became so much closer with loads of the doctors, the nurses. Whereas usually, people are kind of friends, but less so to the extent that it was during COVID. It was really great, it felt like a little family and I enjoyed coming in to work" Junior Physiotherapist, Critical Care

"when it's stressful because of the circumstances that is when people just sort of roll up their sleeves and just get on with it and that's actually quite good in terms of the camaraderie and whatever" Staff Nurse, Critical Care

Traditional working relationships between team members adapted, with staff members becoming closer, developing new modes of communication, and stepping into roles outside of their normal job description to help each other (334).

"I became definitely closer with the consultants through COVID than I did before." Senior Sister, Critical Care

"a lot of the doctors would go in and relieve the nurses for their breaks. So when they were coming in to review the patients anyway they would stay there for the hour, and let the ICU nurse step out. And they'd stay there with the buddies and things. So I think they really valued that and felt part of a team." Senior Sister, Critical Care

I think I felt part of the bigger hospital, I think we've worked really well together among the specialities, especially at the peak of everything. We were really good, we had systems in place, we had backup systems. Even simple things like if we couldn't get hold of the ITU reg, there was a consultant number, I think it was a direct line to the ward. So, everybody knew the role that they had to play in the bigger picture, so there wasn't any sort of long discussion, like we normally would have." Registrar, Emergency Medicine

Working during the COVID-19 pandemic was a shared experience for all those working in the clinical departments studied, and this commonality created an impression of improved teamwork and cohesiveness. Team members reported feeling closer with an increased ability to rely upon and trust each other (334).

"Yes. Because it's something that you've all been through together, and we learned a lot about each other in that time. Everyone learned about the team a lot." Senior Staff Nurse, Critical Care

"We've witnessed something together, but you can say, actually, I can completely depend on that person when everything is really terrible." Senior Sister, Emergency Department

"I think there was definitely a feeling of being more united in purpose and in everyone's going through the stress of dealing with this unknown disease." Physiotherapist, Critical Care

"but by the same token, other things worked better, simply because we had a common agenda." Consultant, Critical Care

Many participants reported an improvement in team dynamics, related to improved working relationships, increased appreciation of each other and a relaxing of expectations regarding what would normally be achieved – possibly leading to less conflict during handovers (334).

"Or sometimes it can be fantastic, particularly for example, during the pandemic surge, all this suddenly became a much more friendly, and more positive interaction. We all seemed to suddenly become angels, in trying to support each other." Consultant, Critical Care

"But yes, definitely some of the normal medical team that were there were incredibly helpful and they valued that a lot." Senior Sister, Critical Care

"Whereas normally the expectation is everything is done when you're handing over, and it can cause an issue or friction if it's not there. And actually that kind of just went." Senior Sister, Critical Care

"we've always been a cohesive team, and I think Covid probably just laid the cement a little bit better." Registrar, Emergency Medicine

To manage the rapid increase in workload many non-specialist staff were "redeployed" into the critical care and emergency departments. These originated from other clinical departments within the hospital, and generally had no prior knowledge of the environment. As such, they required training and supervision from already highly strained staff. The impact of this was a pronounced theme within the data, reflecting its significance for pre-existing staff. There were differing feelings regarding the success of incorporating redeployed staff. The addition of redeployed staff created an increased burden for the existing team (frequently due to lack of knowledge and a lack of time for training).

Not knowing new team members, compounded by facemasks and PPE led to difficulties in communication and effective teamwork. Many participants felt that redeployed staff were not assimilated as well as they could have been – a reflection of the workload, time pressures and high stress levels. However, there was also a strong sense from participants who were

bedside nurses that they wanted to protect them from questioning by medical staff who might not be aware of their non-specialist status, and immense gratitude for the help they provided (334).

> *"But it was more difficult when I was just surrounded by people whose names I didn't know, whose background I didn't know." Staff Nurse Critical Care*
>
> *"Many more people we didn't even know the names of, they were coming in and trying to help. But sometimes they didn't receive enough training before coming to intensive care. It was really, really difficult" Staff Nurse Critical Care*
>
> *"because also there was so many of them, new people as well, and you were just so grateful that they were there. We were just like thank you. They're not going to be ITU nurses in such a short amount of time with the training they had but we appreciate what skills they did have and what they could add to that." Senior Staff Nurse, Critical Care*
>
> *"But again those new nurses were assigned very sick patients that they probably didn't have the skills to look after yet with machines they didn't understand, and things like that. So the whole thing was just incredibly stressful" Senior Sister, Critical Care*

Importantly, negative changes in team dynamics were also reported, with teamwork becoming challenging due to lack of knowledge, a perceived chaotic working environment and as a function of the workload itself. Participants who had seen a positive change in teamwork stated that this had been difficult to maintain once the first wave had ended, mainly due to exhaustion. Later interviews provided participants with more opportunity to reflect on the causes of teamwork breaking down and attempts made to improve them, such as tools to facilitate communication (334).

> *"You saw a little bit more separation and slightly less cohesiveness then we would normally see." Consultant, Emergency Medicine*
>
> *"I'm not sure it was always that rosy, actually. I think that sometimes, the professions were not helping each other" Consultant, Emergency Medicine*
>
> *"It got worse because everybody had such a huge workload. Nobody really had the chance to support each other." Staff Nurse Critical Care*
>
> *"actually it's been off the back of the peak that we've seen the teamwork slightly breaking down just because I think people are mentally and physically exhausted. And so they don't have the time and the energy to be able to put in to do those extra things." Senior Sister, Critical Care*
>
> *"it's been very difficult, and it is still difficult. So I think the whole teamwork thing has fizzled out a little bit actually." Senior Sister, Critical Care*

The breadth of participants' experience and roles within the multi-disciplinary team allowed the exploration of the impact of the pandemic from numerous viewpoints, providing an

appreciation of the multiple challenges and differing responsibilities. Nursing staff described much higher levels of autonomy and decision making than in normal clinical conditions, resulting from the redeployment of non-specialist medical staff and reduced specialist-staff to patient ratios. Senior medical staff described the challenges of being responsible for multiple clinical areas, and an inability to be visible in all areas simultaneously (334).

> *"the nurses on the bed side that were handling the acute situations that you would normally have your reg's come in for" Staff Nurse, Critical Care*
>
> *"No, normally twice a day we have a doctor's ward round where they are physically on the unit, walk around and review the patients. But that stopped happening. And I suppose it was just the lack of medical presence on the floor, so literally if you had an emergency and you called the emergency call bell, you had to wait for the medical staff to don up, come in whenever" Staff Nurse Critical Care*
>
> *"It was strange, because you weren't actually working with the team that you're used to, because the ratio changed. So, you'd be the only ITU nurse in the area, and everyone else was redeployed from other areas." Staff Nurse, Critical Care*
>
> *"There wasn't much medical presence, if I'm being honest, on the unit at the time. I think the nurses felt a little bit more like, we're kind of here on our own dealing with it a bit more than in a standard situation because there's more medical presence." Senior Staff Nurse, Critical Care*
>
> *"But generally, I was very well supported by senior [unclear] staff and then, the nursing staff and other health professionals were just amazing. They just got on with it" Junior Doctor, Emergency Department*
>
> *"it made it tricky if you feel like someone's not coming in." Senior Staff Nurse, Critical Care*
>
> *"But from a clinical perspective and for the more junior staff I would say it was less because the consultants just weren't able to go in to the COVID areas because they were also responsible for patients in other areas" Senior Sister, Critical Care*
>
> *"I think so, yes. I think so. I got a lot of calls asking questions, and I would go in if they needed me, but there were definitely times when we troubleshooted things over the phone, and again that's not something that we'd normally do." Senior Sister, Critical Care*
>
> *"I realised, even myself, I wasn't so supportive to new staff as I could have been because of the workload." Staff Nurse Critical Care*

The increased responsibility experienced by many participants was associated with mental strain and a risk of psychological distress. The exact manner in which responsibilities changed was dependent upon a participant's original job role, but the impact was similar – increased feelings of stress and a sense of being out of control. This change in role also provided further indicators of moral injury – senior staff members reported being unable to support their team members in the way they would normally wish to (334).

"you could sense that they were under a lot more pressure. Their patient load went up a lot. Their workload doubled." Senior Staff Nurse, Critical Care

"For me, stepping into roles that I wouldn't normally do or things or decision-making I wouldn't normally do, there's a short burst of stress followed by an increase in capability" Staff Nurse Critical Care

"But I think the nurses that when they saw me come in they suddenly felt really relieved that I was there, and I just suddenly felt this overwhelming pressure like I don't even know what's going on." Senior Sister, Critical Care

"I think because if something happened with your patients, it was your responsibility to deal with that at the time, because other people there, you can't expect them to know what to do, because they're not trained in intensive care." Staff Nurse, Critical Care

Theme 3: Changes in Psychological Safety

The presence of psychological safety in the participant group was assessed within the analysis relating to the influence of personality, so it was already established that participants perceived psychological safety to be present within their workplace during "normal" times. As the conversation within the interviews evolved to cover the impact of the pandemic, participants were asked if their perception of psychological safety changed during and as a consequence of the pandemic. Participants were generally in agreement that the psychological safety of their working environment evolved during COVID-19, with both positive and negative changes being reported. The unknown nature of COVID-19 created a more accepting environment in which participants felt they could raise concerns or ideas, with participants feeling less anxious that they might appear to be lacking in knowledge (334).

"Yes. Because no one knew what they were doing. And I like the research so I would be reading journals and I could ask the consultants. We never ventilate anyone APRV, we don't use it. Then I was seeing papers saying that maybe that works for COVID patients. So, you just ask, which was nice to be able to have a more level field on that kind of thing." Senior Staff Nurse, Critical Care

"But there might not be as much experience with just the whole situation, in general. Even if it was things about staff management or I don't know, PPE or positioning or something like that, I do think that it was easier to vocalise, if there was anything" Physiotherapist, Critical Care

Psychological safety was also improved by a sense that others understood the potential difficulties an individual might be facing, thereby facilitating open discussion. Many individuals highlighted that the extreme clinical demands precipitated a newly felt "freedom" to be themselves and speak up. Other antecedents to psychological safety such as the

presence of a hierarchy, explored in other aspects of the thematic framework are also likely to have influenced changes in psychological safety during the pandemic (334).

> *"So, I think there was a facilitated broadening of responsibilities of care and opportunity for discussion. So, I think that was done quite nicely actually thinking about it" Junior Doctor, Critical Care*
>
> *"I think so. Probably more so after COVID, yes. I think people are a lot more sympathetic I reckon, and more I guess maybe less judged for bringing up issues." Junior Physiotherapist, Critical Care*
>
> *"It was everyone was just quite candid with each other, and real." Physiotherapist, Critical Care*
>
> *"People certainly felt very free to contribute in a positive way and did so." Consultant, Critical Care*

This analysis built upon the themes of facilitators and barriers to psychological safety identified in the Evidence Synthesis (Chapter 3). New barriers to a psychologically safe environment were described. These included changes in the team and a hectic working environment – with "no time" to speak up or propose new ideas. In this context, having "no time" was a feeling experienced by all those within the working environment, leading to some diminution of psychological safety through a perception that voicing issues would be met with negative responses by those around them, due to time constraints. Not having answers to potential problems, or multiple individuals sharing the same concerns were also reported as being detrimental to psychological safety as it created a sense of futility in voicing issues (334).

> *"I think our structure and hierarchy, above my level, changed during Covid, and sometimes it wasn't always clear who the right person was to go to." Senior Physiotherapist, Critical Care*
>
> *"But it got to the point where nobody was speaking up because they didn't have time to." Staff Nurse, Critical Care*
>
> *"I don't think that environment was conducive to anything, to be honest." Consultant, Critical Care*
>
> *"But it was more difficult when I was just surrounded by people whose names I didn't know, whose background I didn't know. I didn't even know who was more competent than me doing what. If you are with people you don't know much about, then it gets difficult." Staff Nurse Critical Care*

Theme 4: Impact of Personal Protective Equipment (PPE)

All participants were required to wear full personal protective equipment (PPE) whilst caring for patients during the pandemic. The impact of PPE on participants was significant and remained an ongoing issue even after the end of the first wave of the pandemic. Participants

described challenges in effective communication, both between individuals in the same location and with team members outside the clinical area. Wearing PPE caused physical distress, hindered identification of other staff members and acted as a barrier to verbal communication. Communication was reported to be hindered both due to the consequences of masks and full coverage hats and gowns covering facial features, and difficulty being heard through masks (both in person and via telephone) (334).

> *"wearing all full PPE so you don't know who everybody is" Senior Staff Nurse, Critical Care*
>
> *"There's quite a lot of me shouting instructions at people and then PPE communication got difficult, yes, not knowing who anyone was in PPE." Staff Nurse, Critical Care*
>
> *"I definitely rely on a nurse's name being on the board by the patient's bed or a name tag, and you don't have that. You can't even see their faces. Yes. It definitely makes it a lot harder." Physiotherapist, Critical Care*
>
> "*It was wearing PPE for six hours is hard. And, in the beginning, I remember it was half an hour, and we were getting upset. They were all so heavy. And then, by the end of it, wearing it for six hours. And I think it was bit quiet among all of us. I don't know. It wasn't how we normally would be in the break rooms and things like that." Staff Nurse, Critical Care*
>
> *"The thing is, the stress isn't even just because of the patient load. It was wearing PPE for six hours is hard" Staff Nurse, Critical Care*

Shortages in PPE supply early in the pandemic had a significant effect on participants, leaving individuals concerned for their own safety, as well as restricting individuals from freely entering COVID-19 areas in order to preserve availability (334).

> *" for everybody, and that was one of the biggest problems the whole way through, that you're constantly weighing up, is this reason to leave a room or go into a room worth the impact on PPE?" Staff Nurse Critical Care*
>
> *"Yes, definitely, and in fact, the shortage of PPE made that a real problem, because I couldn't just go and do that check-in with multiple people in multiple areas like I normally would do. And I really found that very hard, because actually there just wasn't enough PPE, it wasn't a good use of the available PPE. I didn't mind putting it on and off. If there'd have been more of it, I'd have done it." Staff Nurse Critical Care*
>
> *"And then if they're working in the PPE, we didn't have the right PPE all the time which was concerning" Staff nurse, Critical Care*

The impact of PPE corroborates other themes within this analysis (notably the presence of feelings of isolation) and was a significant cause of perceived barriers between team

members. This eased as supplies in PPE were less restricted, with more team members able to enter the COVID-19 areas.

Those in leadership positions faced significant organisational challenges when trying to mitigate these problems, both in terms of ensuring adequate PPE supply and in creating solutions to improve communication. There were multiple descriptions of cognitive dissonance, as trying to preserve PPE prevented senior staff members from providing visible support in the way they would normally (334).

> *"Whereas they weren't even coming in to do ward rounds because of COVID it was all done kind of via teams and most of the time without the bedside nurse at all." Staff Nurse, Critical Care*

> *"I didn't see one doctor for at least four days" Senior Staff Nurse, Critical Care*

> *"If anything, there was a massive divide between the nursing team and the medical team. Because the medical team weren't as visible and present on the floor and were doing their rounding from an office, so it infuriated the nursing staff. So there was a massive divide and a lot of animosity. There was a lot of complaints made about that." Staff Nurse, Critical Care*

> *"You knew the medical team. They weren't really inside. There was the inside and the outside. It was like through the glass. You're in the PPE and there's everyone outside. So, you're a bit more on your own." Staff Nurse, Critical Care*

<u>Theme 5: Changes in workplace stressors</u>

Many participants discussed the impact of the pandemic upon the presence of the stressors faced within the workplace. An increase in perceived stressors was expressed universally across the participants, irrespective of grade or role within the MDT. A predominant stressor was the hugely increased workload, compounded by the volume of extremely high acuity patients, changes in the working environment and the requirement to use unfamiliar equipment (334).

> *"And then, of course, we've had the pandemic, which is extremely stressful. That was a completely different level of stress that I haven't really been through before." Staff Nurse, Critical Care*

> *"It was madness, absolute madness, but it was life and the tense situation. We adapted to whatever came so it was madness because there was no control about anything." Staff Nurse, Critical Care*

> *"The individual patient contact was more stressful because you had a greater awareness of how sick they were and the potential to deteriorate" Consultant, Emergency Medicine*

> *"Pre-pandemic, I normally don't find work that stressful. It was stressful if I had a sick patient, but it would be easier. If there was one sick patient, no other patient would be as sick as them, so everybody would help out. Whereas during COVID, everyone was sick. Everyone was proned and on*

filter and on every infusion known to man. So, you helped each other but it wasn't like before if that makes sense." Staff Nurse, Critical Care

"And everything had to be fast paced, but it was just a bit overwhelming." Senior Sister, Critical Care

Numerous changes in policies and procedures, often at short notice, were frequently described as being stressors for participants. The nature of how staff were affected by these changes in policy evolved over the course of the interviews (334).

"I think the morale is starting to drop a bit because no one can really work out these pathways." Staff Nurse, Critical Care

"specifically now, given Covid, I think a lot of the stress is a lot of emotional, people's anxiety, meeting expectations, currently having to just be able to adapt all the time, every time there's a new guideline." Registrar, Emergency Medicine

"What was good management this week would probably been seen as not very good management in two weeks' time. That's what, I think, was very stressful and difficult" Consultant, Critical Care

Those interviewed early in the study described frustrations and challenges with protocols adapting to manage the disease itself and ever-changing PPE requirements. This evolved as the study progressed to explore the difficulties in navigating new protocols designed to return hospitals to normality, whilst managing a continuing risk of COVID-19 admissions and areas to nurse these patients (334).

Further supporting qualitative data can be viewed in Appendix 10.

5.6.3. IMPACT – MAP OF EFFECTS AND POTENTIAL FOR CHANGE

This thematic analysis highlighted several areas where the working environment had changed as a consequence of the COVID-19 pandemic, in both a positive and negative manner. These changes were particularly apparent in the context of being identified during qualitative interviews that explored causative factors of stress and those that influenced teamwork in non-pandemic times. As such it was possible to identify changes that had been caused specifically by the pandemic.

This process led to the identification of potential points during a pandemic response where modifications and strategies could be employed to provide targeted support. This support

was designed with two intentions – to reduce the potential impact of new challenges and enhance the positive elements that emerged.

Qualitative data were re-reviewed leading to the creation of a map demonstrating changes in team dynamics and psychological effects (Figure 32). In addition, the map incorporated possible approaches to mitigate negative consequences and promote the positive aspects. Within this map there was a focus upon acknowledging the heterogeneity within the data, illustrating how participants within the same environment could respond differently to the same stressor, leading to a variety of consequences.

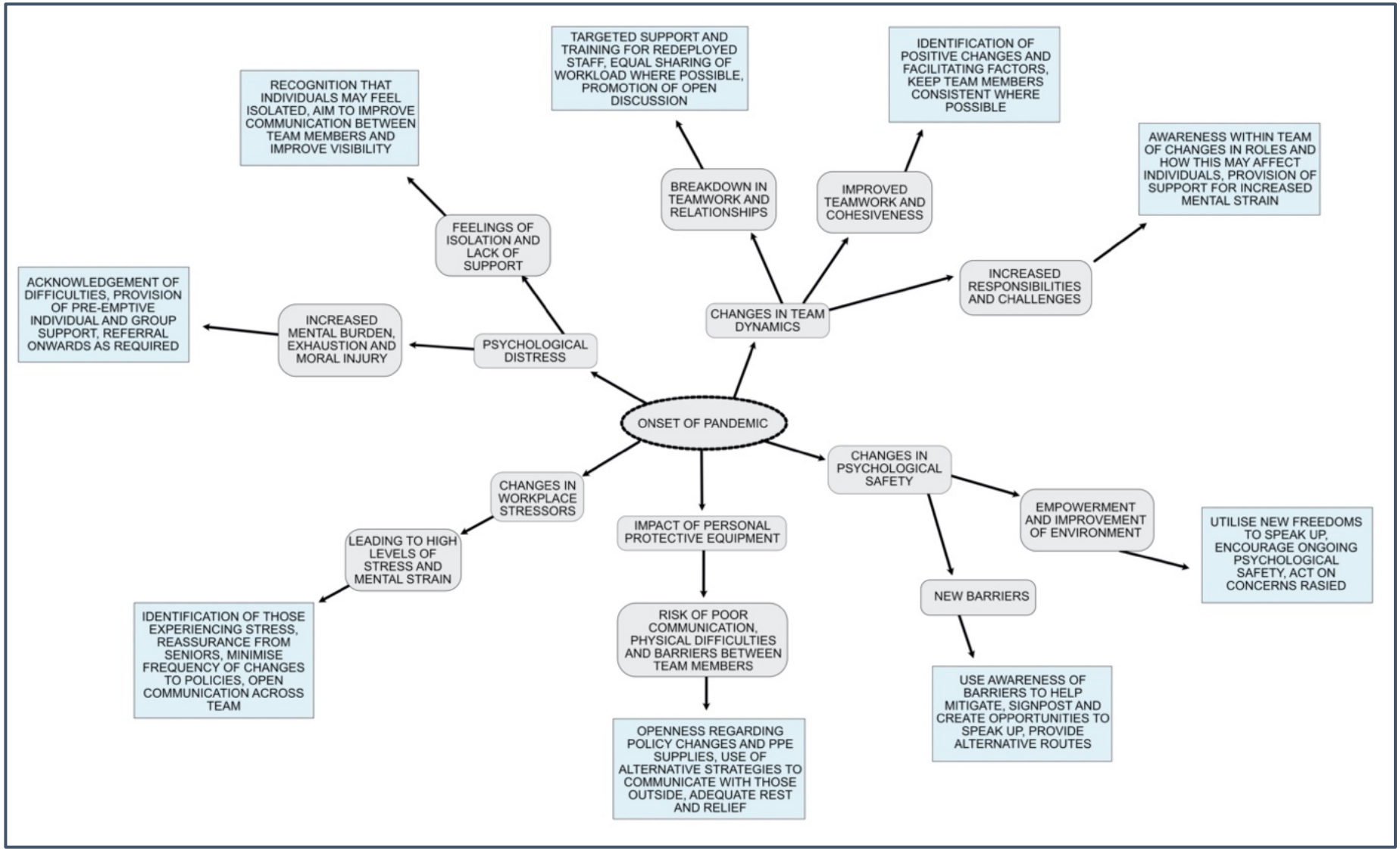


Figure 32. A map of the changes in team dynamics and potential psychological effects as a consequence of the pandemic, with suggestions to mitigate these (334).

5.7. DISCUSSION – LIVED EXPERIENCES OF HEALTHCARE WORKERS ON THE FRONTLINE OF THE COVID-19 PANDEMIC

This qualitative analysis demonstrates that individuals working on the frontline during a pandemic are affected in a multitude of ways. By conducting this analysis within a study exploring teamwork, psychological safety and stress in normal times, it was possible to identify exactly how these had changed as a consequence of the COVID-19 pandemic. Many of the participants in this study demonstrated evidence that they had suffered psychological distress, moral injury and mental exhaustion. Individuals reported feeling extremely challenged when trying to cope with an increased workload and fear of the disease, all whilst providing support to an increasingly strained team. These feelings were compounded by new barriers created by the pandemic, such as the requirement for PPE.

Interestingly, the changes as a result of the pandemic identified in this analysis were not all negative. Beneficial changes in team dynamics also occur as a result of such extreme conditions, including improved camaraderie and enhanced psychological safety, with some individuals finding the experience worthwhile and even enjoyable.

There is a striking heterogeneity of participants' experiences during the first wave of the COVID-19 pandemic within the data and thematic analysis. This highlights how an individual experience can differ, even when the causative factors and triggers are experienced in common. The multiple viewpoints within the participant group demonstrate how changes in responsibilities, an individual's job role and experiences will all combine to create different manifestations of how individuals cope with challenges, the psychological distress felt and subsequent modifications to ways of working.

This also supports the conclusions drawn in the personality data analysis and preliminary work (64) – that individuals will respond differently to organisational challenge, and that bespoke targeted support for team members is required in order to optimise team cohesiveness and functioning.

The heterogeneity of the data in this thematic analysis regarding participants' experiences demonstrate how those in leadership positions should not make any assumptions regarding how individuals will react to a significant challenge such as pandemic response. Leaders need

to be sensitive to the multiple potential personal responses of their staff, have an expectation that there will be differences in response and plan to have several targeted support systems in place.

An individual's experience of their working day is not only influenced by external stressors, but of their confidence in the team they are working with. A team who knows each other well, has faith in the competence of others and can rely on them for help will begin each shift more confident and prepared for the challenges they may face (63). The data in this study highlights how this security was taken away during COVID-19, as individuals had to work in quickly assembled "teams" based upon those available, with strengths and weaknesses unknown. Whilst the presence and commitment of these new redeployed team members was viewed positively and a crucial requirement of the pandemic response, it created a new set of challenges.

The qualitative data in this study can be used to assist those in management and leadership positions with future pandemic preparedness. The map created from the thematic analysis can be used to recognise how a crisis such as a pandemic can improve team dynamics and encourage psychological safety, allowing leaders to continue to foster this long after the event. The analysis also identified that negative consequences arise, and that perceived barriers between teams are often a result of different roles and responsibilities, and new constraints around activities. These data can be used to provide targeted support – ideally pre-empting the development of significant psychological distress and a breakdown in teamwork. Hospital leaders can use this map to assist in the identification of potential problem areas within their working environments, focusing upon the areas that are relevant to them or of greatest need. The experiences of the participants in this study have been used to create potential solutions and improvements to systems and teamwork that can improve the environment and mitigate the risk of psychological distress during crises such as a pandemic. There are also themes and solutions generated within the thematic analysis that hospital leaders can explore outside of a pandemic situation, (such as the impact of staffing shortages and feelings of lack of support) utilising our map to identify issues and generate new ways of working (334).

Although this study was performed in one institution (Imperial College Healthcare NHS Trust), the participants were recruited from the three major hospitals, each running "surged" intensive care services with a variety of subtly differing physical and human environments. Whilst it cannot be said with complete certainty that the experiences described, and the thematic analysis presented are globally representative, there is no reason why the issues identified would not have wider resonance in similar health systems operating under epidemic circumstances. Whilst acknowledging that the participants in this study are predominantly weighted towards those working in the critical care environment, as the effects of a crisis such as pandemic are wide-reaching and affect many departments within a hospital in similar ways, it is possible to anticipate that the risk and manifestation of psychological distress and other themes developed within this qualitative analysis would affect all staff working in areas affected by the pandemic, and not be limited to critical care (334).

5.7.1. STUDY LIMITATIONS

This is a study with a large participant sample, and the use of qualitative interview data allows viewpoints regarding life during a pandemic to be explored in depth. Participants were given the opportunity to discuss their COVID-19 experiences without restriction, creating a rich data set detailing life on the frontline of a pandemic. However, there are some limitations in this analysis.

The original study was designed to explore perceived stressors, the presence of psychological safety and how personality might influence this; but the initial topic guide was not designed to do this in a pandemic.

It is also important to acknowledge that whilst the overall participant sample is purposive, those with experiences relating to COVID-19 are predominantly weighted towards those working in Critical Care. Whilst both populations are represented in the analysis, there is the possibility that the analysis is skewed towards experiences within the critical care department.

5.8.CONCLUSIONS

5.8.1. OVERALL STUDY CONCLUSIONS

This analysis on the influence of personality in healthcare professionals provides unique insights into how predominant personality traits can manifest in this group, and demonstrates a signal that there are differences between those working in different clinical departments.

The qualitative analysis provides new insights into how personalities can influence the workplace, particularly regarding team cohesiveness. Quantitative data also generated novel insights regarding the potential links between elements of psychological safety / perceived stressors and an individual's predominant personality traits.

Personality has long been acknowledged as an important part of candidate selection for professional roles (148) with the intention of hiring individuals who will be successful, fit in with the existing team and be suited to the role – the latter crucially minimising an individual's stress and promoting job satisfaction. The quantitative data in this study highlight that predominant personality traits can vary between different clinical departments and may influence what an individual finds stressful and how this stress manifests. This is supported by qualitative data exploring the lived experiences of those working in clinical environments, illustrating how the personalities of individuals within the team can influence perceived stress and team effectiveness. Whilst the use of personality data in healthcare recruitment may be limited by staff shortages, there may be a role for it in coaching individuals deciding their future clinical specialties and working environments, particularly for those earlier in their careers. In addition, understanding the diversities of personalities may help those in leadership positions, particularly during times of extreme challenge.

The qualitative methodology used in this study has allowed the divergent experiences of those working during the COVID-19 pandemic to emerge. This contrasts with many published quantitative studies that use validated tools to obtain a snapshot value regarding the presence of psychological distress. Whilst the qualitative data do not objectively quantify the levels of psychological distress, they distinctively provide the opportunity for positive outcomes as a result of the pandemic to be highlighted (such as camaraderie, improved

morale and an increase in psychological safety), telling a more nuanced story than can be extracted solely with a survey.

The few existing qualitative studies, (353-356) are small in participant volume and address specific aspects regarding the experiences of healthcare workers during a pandemic. This study gave participants the opportunity to discuss their COVID-19 experiences without restriction, creating a rich data set detailing life on the frontline of a pandemic.

The data provide new detail on how moral injury can manifest within the participant group, deconstructing some of the causative factors during a pandemic. This topic is not covered in similar studies, although acknowledged to be a significant risk for those working during a pandemic (111, 112, 357). This analysis adds to these published articles by providing lived examples of how and why this occurred. The analysis also explores explore how an environment of psychological safety can change and develop during a pandemic.

Crucially, it highlights that the response to a pandemic is heterogeneous, with some individuals experiencing improved teamwork and psychological safety. The stressors associated with a pandemic response are generally unavoidable – such as the requirement for frequent policy changes and the redeployment of new staff who are unfamiliar with the team and the environment. The data and analysis show that it is hard to predict how individuals might respond to an event such as a pandemic based simply upon characteristics such as job role, seniority or prior experience. As such leaders need to maintain an open mind to their workforce and actively assess the individuals working within each team.

5.8.2. CONTRIBUTION TO THESIS RESEARCH OBJECTIVES

This study was designed to primarily address the second research question in this PhD programme, exploring the influence of personality and how it might impact psychological safety. The results of this mixed methods analysis substantially contribute to answering this question and contribute significantly to the building narrative within this PhD programme exploring and explaining the manifestation of psychological safety in the clinical environment. The exploration of how stress manifests in the clinical environment provided data to answer the first and fourth research question. Data to answer these questions were obtained through the planned research, but also through analysing the response of staff to an extreme stressor

in the form of a pandemic response. This provided a unique opportunity to observe how the impact on staff changed depending upon the nature and origin of the stressful event.

5.8.3. INFORMING FUTURE WORK

The knowledge gained through these analyses was used to inform the topic guide and qualitative analysis in the final study – exploring (amongst other topics) psychological safety and stress within hospital managers. In particular, the theme of negative consequences to a psychological safety was identified as warranting ongoing exploration, with the aim of enhancing the potential generalisability of this concept across different professional groups working within the healthcare environment.

6. CHAPTER 6: EXPLORING THE WORKING ENVIRONMENT OF HOSPITAL MANAGERS: STRESS, STEREOTYPES, RESILIENCE AND PSYCHOLOGICAL SAFETY

6.1. INTRODUCTION

6.1.1. RATIONALE FOR STUDY

In this final study I intended to investigate how psychological safety and stress manifest in those working in management roles in NHS hospitals. I also explored whether the manifestation of the phenomena studied would be the same in this participant group, given the different focus of their workload.

This study also incorporated a quantitative assessment and qualitative exploration of resilience (1.5.4), to further develop an understanding of how individuals might respond to stress and organisational challenge.

I aimed to identify modifiable factors that can be addressed with the aim of improving the working relationships and outputs of those within senior healthcare and management teams, aiming to increase job satisfaction, individual wellbeing and organisational safety.

Hospital managers hold a significant amount of responsibility, balancing the potentially competing interests of patient safety, financial constraints, government targets and staff satisfaction (18). Managers are often tasked with overseeing large financial budgets and (amongst many other responsibilities) are required to enhance organisational effectiveness and patient safety standards. In addition, managers must be good communicators and strive to create a positive working environment, both with their managerial teams and clinical colleagues (19).

Existing studies with hospital managers as a participant group are generally limited to two topics of investigation. The first is an exploration into the role of managers and their impact on patient safety and quality of care (18). The second approach is to investigate their competency to perform the role (both self-perceived (358, 359), whether they have the skills

required for the role (such as communication and financial awareness (19)), or their impact on employees (360)).

There is limited research into how managers cope with stress, their perceptions of the working environment and their working relationships with clinical and other colleagues. Current research focuses upon first-line managers who still maintain a clinical role (such as nurse managers (361-364)). Studies that do involve those in purely managerial roles are often limited to questionnaires or surveys. One such survey designed to evaluate depression and anxiety in senior health service staff found higher levels of stress, depression and anxiety than expected in senior managers and hospital staff (365). A structured questionnaire in 67 managers found job stress to be significantly correlated with the presence of burnout (366).

The working relationship between hospital mangers and c222linicians has been investigated, with studies acknowledging that this can be challenging due to competing incentives (typically cost containment vs patient care), and that the relationship must be built upon cooperation (367). The discontent present in these working relationships is attributed to structural and managerial changes within the NHS over time, with the relatively reduced influence of doctors and subsequent diminished autonomy over patient care decisions being implicated (368, 369). A survey of senior managers concluded the relationship between doctors and managers was often unsatisfactory, with clinical directors tending to have more negative views on managers capabilities than those in non-clinical roles (370). A questionnaire study of 107 physicians and 59 managers reinforced this – with hospital managers being seen as “not being aware of what was important for physicians” and “pushing the limits”, whilst physicians were seen by the managers as “lacking insight in the long term” and “arrogant and convinced they are superior” (371).

The presence of psychological safety in hospital managers has not been quantified within the academic literature, despite it being important for organisational safety. It is also seems imperative that those occupying management positions foster a culture of psychological safety in the teams for which they are responsible.

There are limited studies looking at the presence of resilience in healthcare managers (despite it being frequently studied in healthcare workers themselves). Those studies that do focus on managers investigate how managers create resilience within their staff, rather than exploring their own resilience (372).

The study was designed to answer elements of all four research questions within this PhD programme:

1. What is the presence and consequence of psychological safety within the healthcare workforce?
2. What factors influence a psychologically safe environment within the workforce, with particular focus upon the influence of personality.
3. What factors contribute to the presence of stress within the workforce, with particular focus upon the influence of the workplace environment.
4. How do psychological safety and stress impact individual wellbeing and organisational safety?

6.1.2. RESEARCH AIMS

There were 4 main research aims within this study:

1. To investigate how hospital managers perceive their role within the working environment, including:
    - An exploration of working relationships and the presence of stereotyping.
    - Investigating the impact of a participant's background – particularly clinical versus non-clinical.

2. To explore psychological safety, namely:
    - How psychologically safe do hospital managers perceive themselves to be?

- How do they foster a culture of psychological safety in the teams they manage?
- Are there evidence of negative consequences of a psychologically safe environment?

3. To explore the stresses faced by hospital managers within the workplace and contributory factors.

4. To explore and quantify the presence of resilience in the sample of hospital managers.

6.2. METHODS

6.2.1. RECRUITMENT

Participants were recruited from each level within the hospital management structure of Imperial College Healthcare NHS Trust according to a purposive sampling strategy. This ensured a variety of backgrounds, managerial roles and seniority were represented within the participant group. Recruitment aimed to cover a wide range of specialties and departments within the trust. This was designed to create an overall picture of hospital management within the healthcare environment, and as such it was not deemed essential to ensure every speciality was represented.

To aid recruitment, the study proposal was presented at a divisional management meeting within the trust to raise the profile of the study. Potential participants were identified through discussion with senior managers and invited to participate via email. Once participation in the study was confirmed individuals were provided with written materials in the form of a participant information sheet and given the opportunity to ask any questions.

<u>Inclusion Criteria</u>

Participants were required to be NHS managers within Imperial College Healthcare Trust, operating within one of the following roles (regardless of speciality, department or division):

- Business Manager
- Deputy General Manager

- General Manager
- Project or Program Manager
- Divisional Director

The age range for participation was 18-65 years, as this reflects the age range of those working within the hospital environment in these qualified positions.

Exclusion Criteria

Agency staff, NHS staff not working in a healthcare management role, service users and the general public were excluded from participating in this study.

6.2.2. STUDY DESIGN

Qualitative data that would address all four study research aims were designed to be obtained using semi-structured interviews. To support these qualitative data and provide a comprehensive answer to research aims 2 and 3, quantitative assessments of psychological safety and resilience were incorporated into the study design.

This mixed methodology study was designed according to an embedded approach, in which the study analysis was based primarily upon qualitative methodology, with quantitative data enhancing and supporting the results and conclusions drawn.

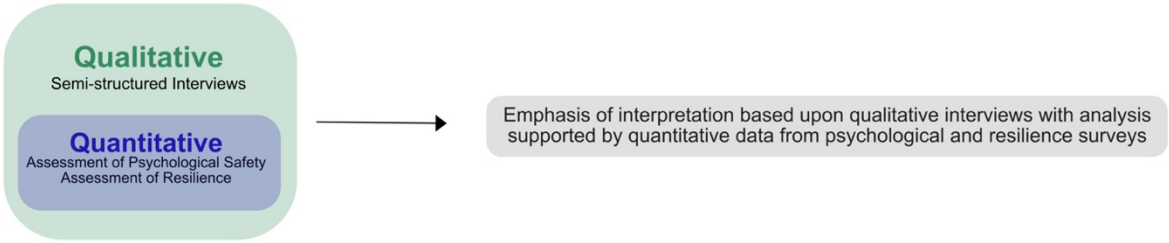


Figure 33. Plan for Data Incorporation and Analysis according to an Embedded Approach.

Study protocols were reviewed and approved by the Imperial College Research Governance and Integrity Team (Reference Number: 20HH6472), the Health Research Authority (REC Reference 21/HRA/0013) and Imperial College NHS Trust. Data collection took place between February 2021 and August 2021

6.2.2.1. Qualitative Interview

Qualitative interviews lasting approximately 30 – 45 minutes were planned. The topic guide was developed following a background literature review and informed by the analyses of previous research studies in this PhD programme. In addition, an understanding of the structure of the management team within Imperial College NHS Trust (ICHT) was obtained through discussion with senior managers and publicly available data on managerial positions within the trust (373, 374).

The topic guide (Appendix 11) was designed to be iterative, incorporating the following themes:

- Overview of roles and responsibilities as a hospital manager.
- Participant's perception of the workplace environment.
- Psychological safety – encompassing participant's own psychological safety, and how they create such an environment.
- How their background influences their working behaviour.
- The presence of stress and development of resilience.

COVID-19 social distancing restrictions remained in place during the timeframe for data collection, consequently the semi-structured qualitative interviews were undertaken virtually via the Microsoft Teams platform. Participants provided written informed consent prior to the interviews and were free to leave the study at any time.

6.2.2.2. Quantitative Survey Data

In order to provide consistency across the PhD programme and facilitate comparison across participant groups the same assessment of psychological safety (26) was used in this study (4.3.2.2). The Likert scale for this assessment was also expanded to a 5-part scale, rather than the 3-part scale used in previous studies to allow for more granular statistical analysis.

In order to evaluate participants' resilience, the Brief Resilience Scale (BRS) (101) was used in this study. The BRS is a simple 6 item survey (with 3 positive and 3 negatively worded questions). Participants rate their agreement with each statement according to a 5-part Likert scale (from strongly agree through to strongly disagree).

The 6 statements within the BRS are as follows:

1. "I tend to bounce back quickly after hard times"
2. "I have a hard time making it through stressful events"
3. "It does not take me long to recover from a stressful event"
4. "It is hard for me to snap back when something bad happens"
5. "I usually come through difficult times with little trouble"
6. "I tend to take a long time to get over setbacks in my life"

These quantitative assessments were administered together as a 13-part survey. Once the qualitative interviews were complete, participants were emailed a copy of the quantitative survey. This was completed in participants own time and subsequently emailed back to the researcher via secure email addresses. No personal identifying information was recorded within this survey (Appendix 12).

6.2.2.3. Plan for Data Analysis

Qualitative data were analysed alongside ongoing data collection in an iterative manner, facilitating the decision to cease further participant recruitment once thematic saturation was achieved. A thematic analysis technique was used to analyse the complete set of interview transcripts.

Quantitative data were analysed within Microsoft Office and SPSS v28 to generate descriptive statistics regarding the presence of resilience and psychological safety within the participant group. There were two subgroups within the participant group – those with a clinical versus a non-clinical background, and junior versus senior managers. A Kruskal-Wallis statistical analysis was performed on summed Likert Scale data within SPSS to assess for any differences in the presence of psychological safety or resilience between these groups. It was not

anticipated that these Likert Scale data would obey a normal distribution, justifying the selection of a non-parametric statistical test.

The 5 points on the BRS are scored from 1 to 5, (with questions 2, 4 and 6 being reverse scored). In line with the analysis strategy undertaken by the creators of the BRS, the data are analysed as a composite Likert Scale and managed as continuous interval data (375). A score representing an individual participant's resilience is calculated as the average of all 6 responses. Values under 2.99 represent low resilience, those between 3.0 – 4.3 reflect normal resilience and those between 4.31 – 5.0 indicate high resilience.

6.2.2.4. Reflexivity

It was anticipated that there would be high levels of stress within this participant group, exacerbated by stereotyping and difficult working relationships. There was no presumption regarding the presence of psychological safety or resilience in this participant group. A reflexive position was maintained throughout the analysis to minimise the risk that any presumptions would affect the analysis and interpretation of the study findings.

6.3. RESULTS

Twenty-two managers were recruited and took part in a qualitative interview, with 20 returning the completed 13-part survey. In line with purposive sampling and the inclusion criteria a broad range of managerial roles were recruited, including deputy general managers, general managers, business managers and divisional directors (Table 20). All interviews were conducted virtually via the Microsoft Teams platform with no technical issues and ranged between 24 and 48 minutes, with an average length of 31 minutes.

Ongoing recruitment to the study ceased once thematic saturation had been achieved, occurring within the first 18 interviews. Only minor modifications were made to the coding framework after this point.

Table 20. Demographics of Participants

Level of Seniority	Managerial Level / Job Description	Background	Number of Participants
Junior	Service Support Manager	Non-Clinical	2
	Service Coordinator	Clinical	1
	Deputy General Manager	Non-Clinical	1
	Business Manager	Non-Clinical	2
Senior	General Manager	Clinical	5
		Non-Clinical	5
	Operations Manager	Non-Clinical	1
	Programme Director	Non-Clinical	1
	Divisional Director	Clinical	1
	Hospital Director	Clinical	1

6.3.1. THEMATIC ANALYSIS AND FRAMEWORK

The thematic analysis yielded a wealth of data regarding hospital managers perception of their working environment, resilience, psychological safety and stress. A thematic framework was constructed which housed 7 main themes (Figure 34). Four themes related to the first research aim – managers' perceptions of their workplace, with the remaining three themes corresponding to the research aims of investigating psychological safety, the stressors faced within the workplace and the presence of resilience.

10% of interview transcripts were coded by a second researcher (CLV) to assess for inter-rater reliability. Sixty-nine codes were created during the thematic analysis. The percentage agreement was >96.3% across all codes, with 19 codes having a kappa coefficient of >0.75, and a further 4 having a kappa coefficient between 0.4 and 0.75. Any discrepancies were resolved through discussion between the study team.

THEMATIC FRAMEWORK - STRESS IN MANAGERS

THEME 1: INFLUENCE OF BACKGROUND

Sub-Themes

- Non Clinical vs Clinical Background
- Significance of background on ability to perform role

THEME 2: ROLE WITHIN WORKING ENVIRONMENT

Sub-Themes:

- Change - Barriers and ability to effect change
- "Helicopter" view of working environment
- Role as facilitator

THEME 3: THE PRESENCE OF STEREOTYPING

Sub-Themes:

- Presence of stereotyping and persistent stereotypes
- Reasons for stereotyping
- Influence of individuals priorities - finance vs. clinical

THEME 4: WORKING RELATIONSHIPS

Sub-Themes:

- Building and maintaining working relationships
- Presence of conflict
- Working in a triumvirate

THEME 5: PSYCHOLOGICAL SAFETY

Sub-Themes:

- Perception of own psychological safety
- Barriers to psychological safety
- Fostering psychological safety in teams
- Experience of negative consequences of a psychologically safe environment
- Organisational culture & Hierarchy

THEME 6: STRESS

Sub-Themes:

- Accountability and potential repercussions
- Bureaucracy
- Expectations and targets
- Responsibilities
- Workload

THEME 7: RESILIENCE

Sub-Themes:

- Presence of resilience and maintaining resilience
- Development of resilience
- Contributors to low resilience
- Provision of support for management staff in comparison to clinical staff
- Ability to ask for help
- Presence of peer support

Figure 34. Thematic Framework outlining Themes constructed during the Thematic Analysis.

Research Aim 1 – Perceptions of the working environment

Theme 1: Influence of Background

Within the topic guide participants were asked about their working background (particularly whether this was a clinical or non-clinical position) and how they felt this impacted upon their ability to perform their current role. These data indicated that the participants viewed themselves as a heterogenous group, with variable skills, backgrounds and ability. Seven of the participants had clinical backgrounds, with the remaining 15 having either managerial / business backgrounds or had progressed through the NHS in increasingly senior administrative and managerial roles.

Many participants described differences in those who had had a clinical background, contrasting behaviours with those who possessed managerial/business backgrounds. Generally, a clinical background was perceived to be useful by improving understanding of the working environment and allowing better communication with clinical staff. However it was also acknowledged that possessing a non-clinical background brought its own benefits to the role. These benefits included analytical ability, being more objective and having dedicated training in managerial skills. This managerial experience also included those with non-healthcare management, again bringing different insights and skills to the role.

> *"I think so because I think it's really good that they do have it [a clinical background]. They have a better understanding of the patients, and the patient's needs and what you are up against with your theatre lists as an example" 0114, Service Coordinator*

> *if they know what the procedures are. Yes, just even understanding the patients, particularly MDTs and that sort of thing. I think it's good to know." 0114, Service Coordinator*

> *"I'd like to believe it [a managerial background] allows me to have an unbiased view. It's not formed based on my own personal experiences of working within clinical areas. The flipside of that is really I have to rely on experts and try to interpret whether the experts are feeding me their priorities or the priorities for the specialities throughout the organisation." 0101, Hospital Director*

Participants also conveyed that working across departments with a group of managers who all possessed different backgrounds and skill sets was beneficial for the overall running of the healthcare service.

> *"And a manager who comes in as manager will be much more focused on maybe various outcomes but not necessarily on how to resolve things and get there in a way that works for the team or they'll do it in a different way. But I think strengths of the NHS is the variety of managers that you've got." 0107, General Manager*

Theme 2: Role within working environment

Participants viewed their role within the working environment in several ways. A prominent topic was participant's ability to identify areas for change, and barriers to enacting such change. Generally, participants were positive about their ability to do this, particularly within their own directorate, however they described a need to engage those around them in order to do so (which at times was depicted as being very challenging).

> *"I think most of the time if you get the right people in the room, and they don't feel done to, that they're part of it, it, sort of, normally works." 0095, General Manager*

Participants frequently described themselves as possessing a "helicopter" view of the working environment, with their viewpoints and understanding covering several departments or clinical areas. This was perceived as allowing participants to have a greater understanding of how several services interacted and shared budgets than their clinical colleagues (who were described as typically being focused upon their own specific clinical area).

> *"And I think that's, in some ways, you can't criticise for them for that because they're only seeing the bit they see… And our job is to have that overarching responsibility and accountability, but sometimes it's a bit difficult to explain that maybe you're not the priority" 0095, General Manager*

Often, managers described themselves being in a facilitatory role – bridging the gaps between stakeholders, explaining reasons for delays and providing clinical staff with the resources they need to care for patients.

> *"I see my role as being able to facilitate some resourcing that they need to be able to do their job, that's a very big part of my role" 0116, General Manager*

> *"I think, upfront I usually say, look, my deadline is X, and probably yours is Y, but if we can try and meet in the middle and understand where I'm coming from, so explain to them why because I wouldn't just have a deadline for a deadline's sake" 0104, General Manager*

Theme 3: Presence of Stereotyping

An explicit research aim of this study was to explore the presence of stereotyping within the clinician – manager relationship. This topic led to two subthemes – the presence of stereotyping and the factors driving such stereotyping.

There was a heterogeneous response when participants were asked about the presence of stereotyping. Many felt that it was "outdated" and was no longer present within their working environment. This contrasted with other participant views that clinicians often saw them (managers) as purely finance or target focused, and not being concerned with clinical care or patient outcomes. Participants stated that they were also seen by clinicians as moving professional roles frequently – with clinicians not expecting them to be in each post for long and viewing this negatively.

> *"So, clinicians will think, oh, this is about, to make them all balancing the books. Whereas, actually, it's a real opportunity to set out what you want. Any business plan is about what you want to do. What you want to do on behalf of your patients and your people, and what that means to your bottom line, in terms of money." 0108, Divisional Director*

> *"So, we worked quite closely alongside each other since the day I got here, and one of the first things he said to me was, management never stay. This is a consultant-led kind of environment because management just don't stick around. If I don't get on with management, I'll wait until they disappear, and the next lot to come in in 18 months' time and we'll just carry on that way." 0096, General Manager*

The occurrence of stereotyping was felt to be driven by a lack of understanding from clinicians of what a manager's role encompassed and the constraints they faced. This links to the previous sub-theme of managers having a "helicopter" view of the workplace environment. It was also felt that clinicians didn't often understand that managers viewed their role as primarily improving patient care but aimed to achieve this through the improvement of resource allocation rather than direct clinical care. Stereotyping was also perceived to be influenced by the different priorities of individual stakeholders, classically clinical versus financial.

> *"But I think that's people not understanding we're responsible for the governance, we're responsible for the quality and safety. It's a lack of understanding." 0102, Deputy General Manager*

> *"So, I think, yes, that we do come across it a lot. And, you almost have to make more of a deal of it, because I think people expect you just to be interested in money. But of course, if you look after the money, we can provide care for more patients. So, yes, actually I'm worried about all the patients." 0106, General Manager*

> *"I think the consultants are more interested in the patient, absolutely and they don't want to learn about finance, but they recognise that finance is there, but they expect somebody else to deal with that." 0107, General Manager*

Theme 4: Working Relationships

Building and maintaining good working relationships with clinical colleagues was clearly very important to the participant group and seen as being essential to creating successful change and service improvement.

> *"Managers come and go, but the clinicians tend to be there for a long time, and it's their service and they're the ones that are usually really passionate about it. And you really have to build your relationships with them in order to really drive through the changes and the improvements that you want." 0117, Service Coordinator*

Many participants described episodes of conflict between themselves and clinical staff. This was generally underpinned by a lack of financial resources and the subsequent limitations on managers initiating service improvements seen as important by clinicians. It was also felt that managers bore the brunt of clinicians' frustrations when requests weren't approved, even though this was out of their control.

> *"Sometimes you get consultants or nurses who, sometimes due to an experience or sometimes due to frustration, feel that it's the wrong decision. And clearly trying to manage that reaction is sometimes tricky. But I think to a certain extent it goes with the turf, unfortunately." 0101, Hospital Director*

Many of the participants interviewed worked in a triumvirate – consisting of a senior nurse, senior doctor and manager. This was reported as a beneficial way of working as the combination of skills and experiences worked in synergy.

> *"I think the triumvirate works very well if you get one doctor, one nurse, and one manager, I think, because you all bring different perspectives towards the same goal. And I think if the triumvirate works well in cohesion, I think the success can be really, really incredible." 0109, General Manager*

Research Aim 2: Investigating the presence of psychological safety

Theme 5: Psychological Safety

There were two main focuses within the interviews regarding psychological safety – the perception of a participant's own psychological safety and how they created this environment within their own team.

Participants conveyed mixed views when discussing their own psychological safety, with a significant number of negative themes present in the data. Whilst experience and longevity within the team were attributed to improving psychological safety, many participants expressed that although they felt "safe" to speak up, they had little faith that their concerns would be acted upon or would lead to change. There were examples of managers being concerned to raise things to those more senior within the organisation, therefore utilising alternative routes to raise concerns.

> *"I think it depends which executive you're talking to. If I wanted to raise a concern, yes. If I wanted something done about said concern, that responsibility firmly sits at my feet." 0105, General Manager*

> *"I think it's always a bit frowned upon, isn't that, that you're going above your current level of management. I feel like it's always seen in that way." 0109, General Manager*

Barriers to psychological safety included fear of repercussions, risking negative reactions from seniors, a lack of availability/opportunity to speak and difficulty being heard within large meetings. These concerns were reflected in discussions regarding the organisational culture and how it impacted on psychological safety. Some participants described an organisational culture that discouraged speaking up, contrasting other participant views that a cultural shift was developing to improve psychological safety.

> *"I've also got managers above me who don't want to listen to the reality of what's going on either" 0107, General Manager*

> *"I think it's just a real, acute trust culture, where you think, if you speak out, that'll be it. You'll be, you know. Just get on with it" 0106, General Manager*

> *"I don't think that there's a strong culture of standing up and saying this isn't right or I don't agree with it or is there a better way of doing it." 0098, General Manager*

> *"A lot better than it used to be. I'd say there's been a kind of cultural shift in the last five to ten years. It's still not perfect, but it depends on who you talk to how receptive they are. But, generally, I think there's much more willingness to listen at least. Yes. There's been a sea change, yes." 0104, General Manager*

Participants were almost universal in positively describing the perceived psychological safety of their own team. An environment of psychological safety was described as being fostered

by participants through the creation of an "open door policy", allowing team members to raise concerns. A very strong ethos of participants feeling that their team were able to speak up was present within the data.

> *"I personally do and particularly encourage my team, the team a level below me and a level below that to do the same, to get the feedback and get, how can we change things, how can we do things? It's not always easy." 0107, General Manager*

> *"I don't want you to ever feel that you can't come to me with anything. So I suppose the approach is being really clear with people, but also actively seeking out conversations." 0100, Divisional Director*

The presence of potential negative consequences arising from a psychologically safe environment were discussed. Reported examples included having time taken up with multiple concerns and queries, knowing when to intervene in issues raised, and feeling responsible / accountable for problems once they had been raised.

> *"Yes, it has quite a few downsides. There's a purely personal one, which that it can be really exhausting. So if you set yourself as a, I'm going to be someone who anyone can speak to, you have to be willing to accept the fact that anyone might come and speak to you. As well as taking up a lot of time, which is fine, you can manage that, it can be really difficult to absorb all those other issues." 0100, Divisional Director*

> *"I think so. I think I have. Yes, I think so. I think you need to learn to draw the line. I think you can work very hard at stemming the tide and stress. You're trying to protect your team, and delegate the responsibility, and remind them that, ultimately, I'm responsible. But sometimes, you're absorbing all that, and you're trying solve the consultants' problems, and it all comes here." 0106, General Manager*

Research Aim 3: Exploring the presence of stress

Theme 6: Stress

A major stressor identified by participants was the pressure to meet targets, and their own accountability. In addition, the amount of bureaucracy navigated when trying to implement changes was highlighted as a frequent source of stress.

> *I think the most stressful bit is having to sit in front of a panel of people and explain why you weren't able to deliver the impossible." 0110, Business Manager*

> *"Even though we work as equals, at the end of the day, if anything goes wrong, then all the joy of the accountability sits with me." 0116, General Manager*

"I think there is far more bureaucracy in the NHS that impacts on what we do. So, the red tape to get things done and the delays that are out in about decision making really makes the job hard." 0107, General Manager

Stress caused by the expectations placed upon managers by their seniors was a prominent sub-theme, exacerbated by the fact participants often stated that meeting targets was out of their control. Another prominent stressor was the burden of responsibility – particularly in relation to the size of the budgets they were in control of, as well as the stress of ensuring the decisions they made regarding resources, junior team members and patient care were the right ones.

"Yes, and I think that probably is the most stressful bit about just being in management, is just having to be answerable to people, the powers-that-be, about why you're in the position that you are, because there are a lot of things that are out of your control" 0110 Business Manager

"So, if you're looking at individuals who have to manage businesses that turn over £50 million a year that's a big-time business, and that's a big-time team, but that's similar to what each General Manager at [Company] do. And it's like a big-time business. You've got all of your huge expensive equipment, you've got all your expensive clinicians, you've got your safety metrics, quality metrics, financial accountability. That's a full business unit within a wider hospital" 0113, General Manager

"And I still feel quite stressed by the responsibility of that and making sure they're okay. Even though I know it was the right thing to do and I stand by the decisions I made" 0103, Programme Director

These stressors all contributed to the final subtheme of workload (and by default work life balance). Many participants reported often working significantly beyond their scheduled hours. This was influenced both by volume of work but also an expectation that they would be available at all times.

"because unfortunately everyone comes to you, but you don't have anyone to go to. And then it gets to the point where you're not sleeping. Managers don't get paid overtime. I would be going in on the weekend. You don't get paid for that. That's my decision to go in." 0102, Deputy General Manager

"And then I think we're not very good as managers, we talk a lot about managing our own well-being and work/life balance and all that stuff, but we're not very good at living it." 0100, Divisional Director

"You get given a work phone, and then people can reach you anywhere, and you're expected to check emails" 0117, Service Coordinator

Research Aim 4: Assessing the presence of resilience

Theme 7: Resilience

The qualitative interviews yielded data regarding participants perceived resilience, contributors to low resilience and how they felt resilience was developed. This led to a broader discussion regarding the availability of support for managers.

Many participants confidently stated that they perceived themselves to be resilient. Factors that contributed to this resilience included successfully managing the challenges associated with their working role and learning from experience.

> *"I think, I don't know, it depends on how resilient you are, but I've learned resilience because you know that the things you might be stressed about one day, probably aren't going to be the things you're stressed about the next day and the next day." 0106, General Manager*

> *"I'm quite resilient. I'm definitely more resilient than what I used to be" 0104, General Manager*

> *"Oh, yes. I've not had some great experiences, but each one, I'm taking with me and I've learned something from it. It's definitely improved my resilience. I'm not the same manager now that I was five years ago, 100%. And, I think I've had quite a steep learning curve in relation to that. I don't know if that means I've been lucky or unlucky." 0105, General Manager*

Participants also discussed contributors to low resilience, including frustration with financial constraints, working with difficult colleagues and lack of support.

> *"I think there's a bit about working with difficult people as well. I think as you work higher up or climb the ladder or whatever you call it, you do face a lot more challenges in getting things approved, getting things done, and you do face a lot more obstruction" 0110, Business Manager*

> *"I think that not being heard is really important, and I think if you see that your own leadership lacks courage or commitment to patient care, then that's hard and that causes stress." 0116, General Manager*

There was a strong theme in the data that managers felt unsupported by the organisation, particularly in comparison to their clinical colleagues. The interviews highlighted the lack of a formal support pathway if required, and participants described feeling unappreciated.

> *"And like you said, we're forgotten as admin I would say. That there's this whole work we're doing in the background, but nobody really thinks that we still have to come to work every day. We have to do all of that. We still have a personal life and problems in personal life…….. So, I think we are a little bit overlooked in how things can be done." 0112 Service support manager*

"There wasn't a mechanism so that I could actually call off to help her. So, where would I get help for her, was the question? I even asked them, I went through the various leads and stuff. Where does this individual get the support? She can call up for support in the organisation, but she didn't have what, you're right. The medics have, actually, trainees in distress, I think it's called, and they didn't get the bespoke support." 0108, Divisional Director

The iterative nature of the topic guide, and the strength of participant feeling regarding their lack of support subsequently led to participants being asked whether they felt able to vocalise if they were struggling or needed extra help. Many stated that this was not the culture within the organisation and that they were expected to "just get on with it".

"Oh, absolutely. You can't admit that you're struggling. You have to do long hours. It's accepted of you. You can't possibly leave at five o' clock. And, definitely, most people are martyrs, of course." 0105, General Manager

"Yes, I think so, definitely, particularly the more senior you get in an organisation, it's seen as a sign of, kind of, weakness, which is wrong because basically I think sometimes when you talk over something with another colleague or a secretary, you can work it out much quicker. I think managers are seen to be a different breed, and actually we're not" 0104, General Manager

Whilst organisational support was universally described as lacking by participants, there was a sense within the data that peer support from other managers had improved recently. This took the form of collaboration across directorates, having the effect of enhancing group psychological safety and improving problem solving.

"has really brought us much closer together, and across divisions, across directorates, whereas before we tended to work really quite siloed. But now I think, yes, definitely. I know somebody who's got skills in another area who I would have no problem going up to and saying, look, basically, I know you've got the experience with this, how did you work this out, and vice-a-versa. People will come to me. So, yes, to share skills and knowledge is good." 0104, General Manager

"So, you really need your peers, and I think, and it must be the same in medicine as well. It's just talking, oh, and everyone's got the same issues. You can often sort problems out. When I was a deputy manager as well, the camaraderie you get, I think, is really important. That, almost more than anything, is a good way to just take the overwhelmingness of it." 0106, General Manager

"if you get all of us together, there's actually not a lot that we can't do. And there's not a lot of people that can say we can't do it, either, because we're all together." 0094, General Manager

Further supporting qualitative data can be viewed in Appendix 13.

6.3.2. QUANTITATIVE ANALYSIS

6.3.2.1. Psychological Safety

The heterogeneous nature of the qualitative data on psychological safety in the participant group was reflected in the quantitative survey data (provided for 20 participants). Thirty percent of participants agreed / strongly agreed that if they “made a mistake on this team it would be held against them”, 40% of participants disagreed that “no one on this team would deliberately act in a way which undermines my efforts”, 25% disagreed that they felt “safe to take a risk on this team” and 20% agreed that “people on this team sometimes reject others for being different”.

Participant responses are illustrated in Figure 35.

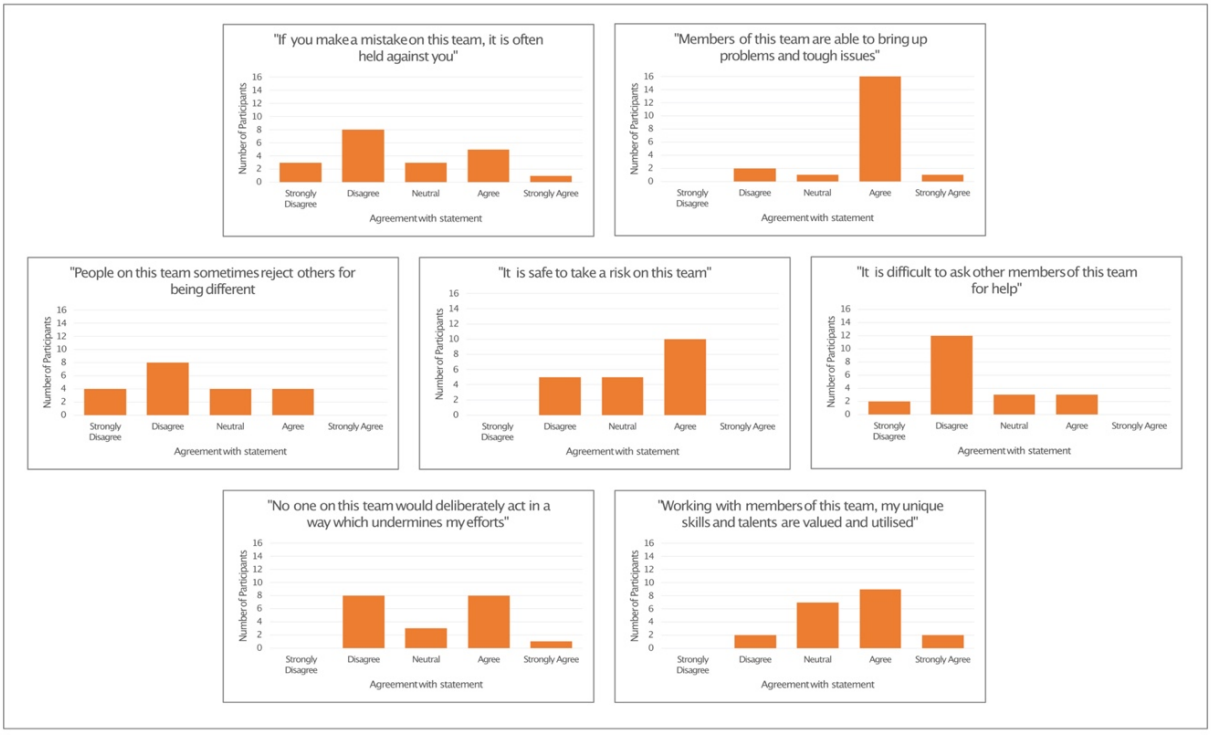


Figure 35. Participant agreement with statements assessing the presence of a psychologically safe environment.

A Kruskal-Wallis test was performed on the summed means from these Likert items, comparing the psychological safety of those with a clinical background vs a non-clinical background, and according to level of seniority. Participants who had a clinical background demonstrated higher perceived levels of psychological safety, although this did not quite

reach statistical significance (H(1) = 3.73, p=0.053). There was no significant difference in psychological safety according to level of seniority (H(1) = 0.148, p = 0.7).

6.3.2.2. Resilience

The qualitative analysis demonstrated that participants believed themselves to have become resilient as a consequence of prior experience of organisational challenges. The quantitative data from the BRS in 20 participants were analysed to ascertain whether or not they would support the conclusions drawn from the qualitative analysis. One individual had low resilience (values <2.99), 16 scored within the normal range for resilience (3.0-4.3) and 3 participants had high resilience (>4.31).

These scores, with a majority of individuals scoring “normal” for resilience are reflected in the breakdown of the answers for each statement, illustrated in Figure 36.

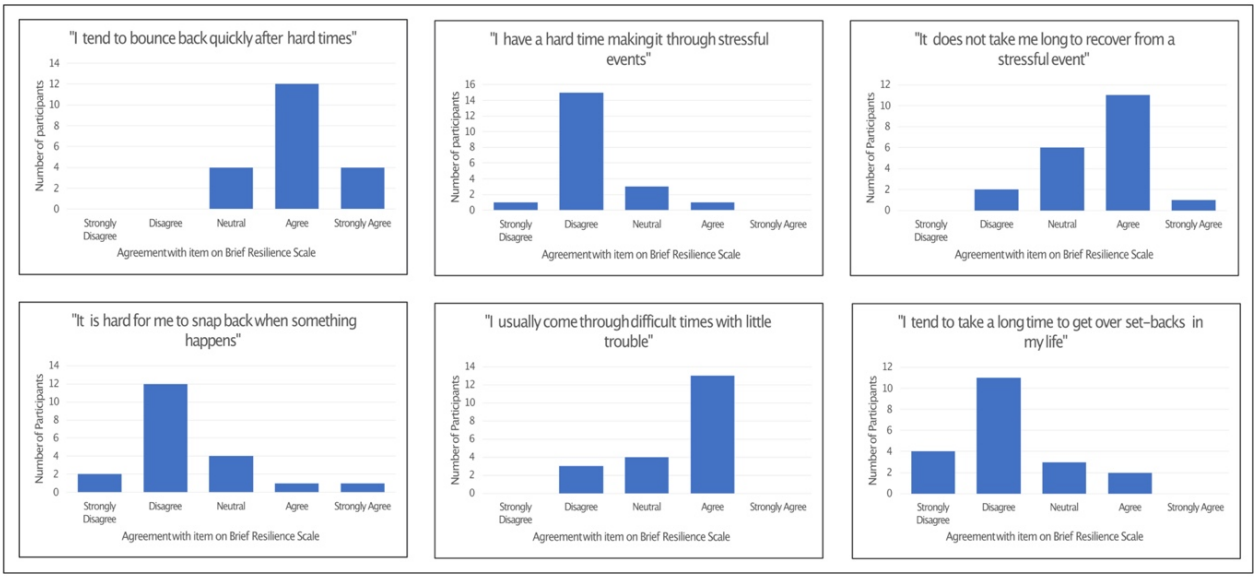


Figure 36. Participant agreement with the 6 statements comprising the Brief Resilience Scale.

A Kruskal-Wallis test was performed on the summed Likert Scale data to ascertain whether a participant’s background or level of seniority influenced the resilience they had within the workplace. Those more senior were statistically more likely to have higher scores for resilience (H(1) = 6.445, p=0.011). There was no significant difference in resilience according to a participants background (H (1) = 0.518, p = 0.472).

6.3.3. MAP OF KEY FACTORS IDENTIFIED IN A MANAGER'S WORKPLACE ENVIRONMENT

The mixed methods analysis allowed contributing themes and key factors influencing an individual's wellbeing and the level of organisational safety to be identified. Data were re-reviewed, dividing these themes according to whether they had a positive or negative influence. This information was utilised to develop solutions that might improve outcomes such as psychological safety and subsequently the goals of improved individual wellbeing and organisational safety. These ideas and themes were used to construct a map, highlighting potential points for modification and how these factors may be inter-dependent upon each other (Figure 37). The aim of constructing this map was to create a tool for senior healthcare leaders and managers that would allow them to identify the presence of these key issues within their own workplace. It is envisioned that this map will assist in the design of interventions to improve working conditions for hospital managers and the wider healthcare leadership team.

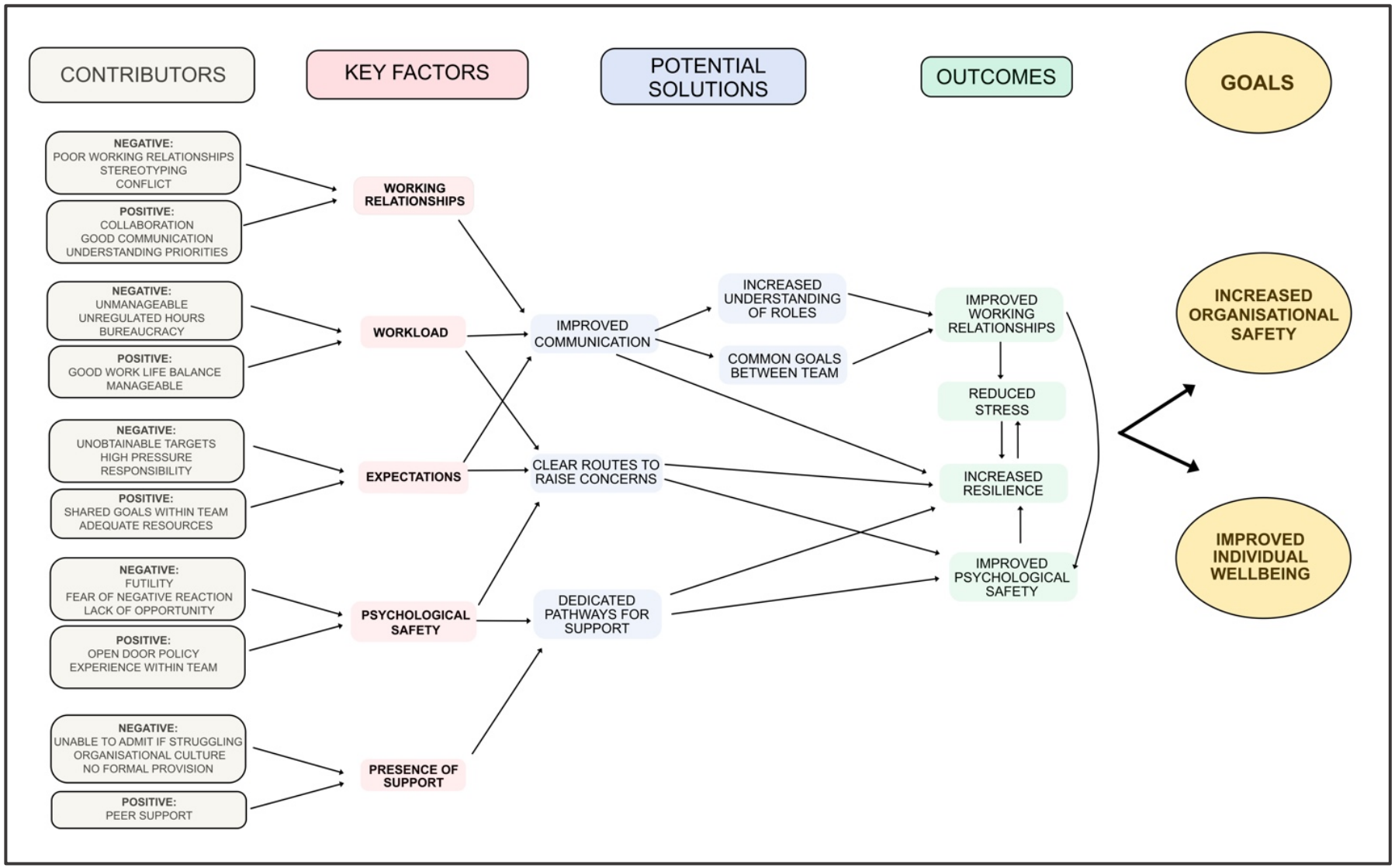


Figure 37. A map highlighting positive and negative contributors to factors that influence the goals of organisational safety and individual wellbeing in hospital managers.

6.4. DISCUSSION

This study yielded a wealth of novel information regarding the behaviours and experiences of hospital managers within the NHS Trust studied, particularly with respect to the manifestation of stress and psychological safety. These insights are useful for those wanting to mitigate some of the stress felt by managers, improve their working conditions and develop better working relationships between managers and clinical staff.

The presence of stereotyping (and subsequent expectations of how individuals will behave in the workplace, particularly with respect to their work priorities) is well acknowledged within the existing literature (367, 368, 370, 371). The data in this study provide insights into how this stereotyping can manifest - driven by a lack of understanding of each other's roles and different targets and priorities. Positively, the analysis also demonstrated a clear trend in the dissipation of such stereotypes – described by many participants as outdated.

It was interesting to note the acknowledgement by many managers that clinicians disliked them moving posts frequently. This again reflects a lack of understanding between the two professional groups, as it results from differences in career progression between the two – with managers needing to move roles in order to progress, a very different method of career progression to clinical colleagues. It is possible that clinicians do not appreciate that more junior managers are also "in training" and need to move between departments and directorates to gain experience and seniority.

Despite the ongoing prevalence of stereotypes, all agreed that developing and maintaining good working relationships was key when implementing change and improving the service delivered to patients. A prominent theme within the qualitative data was that despite a manager's role being finance or target focused, this was all with the larger aim of benefiting healthcare delivery and the quality of care available for patients. This is a viewpoint that can help build clinician – manager relationships if all stakeholders agree that their goals within the working environment are ultimately in common.

This study aimed to explore the perceived impact of an individual's background on their ability to act in a managerial role. Many participants acknowledged that there were differences in managers with a clinical background vs those employed via other routes. Generally there was

a view that when taken as a collective, these differing backgrounds provided benefits, including improved peer support and collaboration. Interestingly, managers with a clinical background demonstrated higher scores for psychological safety, perhaps reflecting a longer period of time spent in the healthcare workplace, or a greater understanding of how and when to speak up in this environment.

The manifestation of psychological safety was explored in two different ways within the interviews. When asked about their own psychological safety, views tended to reflect a more "unsafe" environment. More negative perceptions of a participant's own psychological safety were predominant in more senior managers, perhaps reflecting the seniority of those to whom they were required to raise concerns (those at executive level within the organisation). This inability to speak freely and raise concerns has grave implications for organisational safety and learning, increasing the risk of repeated errors occurring.
Quantitative data highlighted issues with psychological safety in managers that were more prevalent than in clinical participant groups investigated in previous studies, such as an increased sense of feeling undermined and that mistakes would be held against them.

Despite describing their own psychological safety as sub-optimal, all participants agreed that they were able to create an open culture, encouraging speaking up and raising ideas in the teams they managed. This facilitated a discussion regarding the potential negative consequences of psychological safety, particularly for the team leader.
In addition to corroborating existing themes within this PhD programme such as "impact on bandwidth" and "increased workload", the analysis highlighted new potential negative consequences. These included becoming accountable for problems raised and a sense of responsibility to solve issues. Interestingly, other themes identified in previous studies were not present, such as "motivation to speak up".

These data highlight how the phenomena of psychological safety and its potential negative consequences can manifest in different ways within different professional groups, even within the same workplace. Whilst the presence of such phenomena are demonstrable and likely generalisable across many environments, individual assessments of each environment

are required to identify nuances in their manifestation and develop bespoke strategies for improvement.

The manifestation of stress in hospital managers differed from that seen in clinical participant groups. Specific stressors for those in management roles included the presence of bureaucracy when trying to design and implement change and the expectations placed upon managers to deliver. There were also stresses that corresponded to those seen in previous studies in participants with clinical roles, including high workload and the level of responsibility. This may highlight how the nature of an individual's role influences their perceived stress.

Participants discussed how they had developed resilience as a function of repeated negative experiences and stress, and what contributed to low resilience. Whilst the majority of participants scored "normal" for resilience, only 3 scored "high", indicating some room for improvement, particularly as resilient individuals are beneficial for safety and organisational memory in challenging environments. Managers with a more senior background demonstrated higher scores for resilience – corroborating themes in qualitative data that resilience developed due to repeated challenge. A significant number of participants felt that there was very little support provided for mangers in difficulty (a theme increasingly investigated as the interviews progressed). Managers contrasted the provision of support for themselves to that provided for clinicians in similar situations, leaving many participants feeling that they were overlooked and possibly undervalued as a professional group. A culture of not being able to ask for support was also reported, with a sense of having to "get on with it" even in the face of personal difficulty or challenge.

The findings of this study demonstrate that there is room to improve both the psychological safety and the resilience within hospital managers. It is unlikely that the concerns expressed, or challenges faced will be unique to this participant group, therefore these data are useful for all those wishing to improve the experiences of managers and their working relationships. The predominance of qualitative data within this analysis and the achievement of thematic saturation provide confidence that this study represents a realistic account of the experiences of hospital managers within the study setting. Many participants had also worked in numerous NHS healthcare trusts and described consistent experiences across different

environments and organisations. This consistency in experience enhances the generalisability of the data to other groups of managers working in similar healthcare organisations.

Ongoing analysis of the data set allowed the key factors described as important for organisational safety and individual wellbeing to be identified and compiled into a thematic map. This highlights modifiable areas within the workplace environment for healthcare leaders to focus upon when striving to achieve culture change, improved support and the working lives of their managerial workforce.

6.4.1. STUDY LIMITATIONS

There are some limitations within this study. Whilst the participant group was designed to obtain an overall and broad view of life as a manger within a large NHS trust, the lack of analysis according to specialty / department may have missed nuances that contributed to stress or psychological safety in some participants.

The study is also at risk of participation bias – those with an interest in stress / psychological safety or resilience may have been more inclined to participate, as may those who have had particularly stressful experiences within the workplace.

One research aim within this study was to investigate for differences between those managers who had a clinical background and those who didn't. Whilst a signal that differences exist was highlighted in this analysis, the recruitment strategy was not designed specifically with this in mind, and as such the number of participants in each sub-group is not equal. This could be addressed in further more quantitative studies intending to explore these differences further, by matching the size of the groups. The participant group was also divided according to their level of seniority – again the recruitment strategy could have been adapted to ensure these groups were reflected in equal numbers.

The study analysis demonstrates conflicting views regarding psychological safety in the managerial workforce. Almost exclusively, managers reported their own psychological safety as lacking, but were confident that they promoted it within their team. Given the participant group contained managers at all levels of seniority there are some inconsistencies within this story. It would be useful to investigate this further, studying psychological safety within

managerial teams, to explore the differences and identify precisely where barriers to psychological safety occur within the organisation.

Comparing data on psychological safety within this participant group to that obtained in the preceeding studies on clinical staff highlights differences in reported levels of psychological safety and its manifestation. While this provides a clear signal that differences in psychological safety exist, this study did not directly compare managers and clinicans within similar working environments (for example exploring differences in psychological safety within a triumvirate, or according to a specific department). Additionally, we did not directly compare clinicans who have a managerial role (likely to be consultants / senior nurses) with those in purely managerial positions. Conducting a more detailed analysis with subgroup comparisons may provide more information on the nature of psychological safety within these professional roles.

6.5. CONCLUSION

6.5.1. OVERALL STUDY CONCLUSIONS

This study provides novel insights into the differences in the manifestation of psychological safety and stress when compared to previous studies in this PhD programme on clinical staff. As such, it highlights nuances within the workplace environment that will impact different professional groups in different ways, including the size of the team, working relationships and burden of responsibility.

Despite working within the same organisation, psychological safety manifested differently in hospital managers, both in its existence and potential negative consequences. This may reflect the significance of the immediate team upon an individual's psychological safety, and demonstrates how an organisation may have several cultures, even within the same workplace. The analysis highlights that psychological safety may be influenced by an individual's background – managers with a clinical background scored higher for their self-perceived psychological safety.

The in-depth exploration and analysis of how managers perceive their working environment, the associated stresses and the impact of this stress provide new insights into the aetiology of stress and the development of resilience. This can be used by both hospital mangers and senior clinicians wanting to gain an enhanced understanding of the stresses faced by managers, with an aim to improving working relationships.

6.5.2. CONTRIBUTION TO THESIS RESEARCH OBJECTIVES

This exploration of stress and psychological safety in hospital managers provide a wealth of data that contribute to answering the research questions within this PhD programme. The data from this study builds on that obtained previously, providing more detail on these phenomena within a different participant group, expanding to include data about important related concepts, such as resilience.

7. CHAPTER 7: FINAL DISCUSSION AND CONCLUSIONS

7.1. DISCUSSION

The research contained within this Thesis was designed to explore the presence and impact of psychological safety and stress on workers in the healthcare environment. These were identified as areas that warranted further investigation in response to identified concerns regarding staff welfare and difficulty maintaining the NHS workforce (with staff dissatisfaction a major contributing factor to those wanting to leave the profession.) (11, 12). This has only been exacerbated by the COVID-19 pandemic (376), becoming very apparent in its aftermath.

The ongoing incidence of medical errors was another inspiration for the research in this PhD programme (117) – with the hypothesis that low psychological safety and high individual stress levels would increase the likelihood of errors and have negative implications for organisational safety.

The presence of individual psychological safety is crucial for wider organisational safety, the prevention of error and the enhancing of organisational learning (28). High levels of psychological safety will indirectly improve an individual's wellbeing, helping them to feel confident, engaged and a valued member of team (21, 377). Its role as a contributor to both individual wellbeing and organisational safety justifies the in-depth exploration into its manifestation and influence that was undertaken.

If working in a psychologically safe environment will enhance individual wellbeing and organisational safety, the stresses faced by individuals during their working day can lead to sequalae that will undermine both. This Thesis highlights key stressors faced by healthcare workers and their potential impact. Whilst workload and job demands are significant within healthcare roles, this may not be the cause of low staff satisfaction. The job demand control model – supported by data within this Thesis postulates that a worker will operate best under conditions of high job demand if associated with high individual control (known as decision latitude).

Optimising psychological safety and minimising stresses are therefore two noble aims for all those in healthcare leadership positions. Throughout this PhD programme higher order analyses of qualitative data were undertaken to synthesise the study findings and produce frameworks and models. These models identify modifiable areas for change and where appropriate incorporate potential solutions that can be applied to a variety of workplace environments. The wealth and breadth of data collected across participants from several healthcare environments increases confidence that these models will be generalisable to other healthcare organisations. Whilst these general themes are likely to be present, there will be subtle differences in each workplace due to different personalities, unique stressors and differences in organisational cultures. It is envisioned that these models can be used within individual healthcare departments to understand the points at which modifications may be possible, leading to individual and nuanced applications of the tools.

Detailed discussion regarding the findings of each study are presented within corresponding chapter in this Thesis. This final chapter aims to summarise the findings across the PhD programme, using data from each study to answer the four research questions posed at the beginning of the Thesis. Where possible, a further inductive higher order analysis was undertaken combining qualitative data within the studies to build upon concepts and conclusions identified within each individual analysis.

Research Question 1: What is the presence and consequence of psychological safety within the healthcare workforce?

The Presence of Psychological Safety

The four research studies within this PhD programme all evaluated the presence of psychological safety in healthcare workers. The evidence synthesis highlighted heterogeneity in the presence and manifestation in psychological safety across the 62 included papers. Given the breadth and variety of healthcare environments this study encompassed, it is not surprising that the analysis yielded mixed results regarding individual participants perception of their psychological safety. Of note, the evidence synthesis strongly demonstrated a sense that psychological safety was perceived as being beneficial within the healthcare setting. The

findings from this evidence synthesis corroborate the positive view within existing psychological safety literature regarding it as universally beneficial.

Quantitative data from clinical staff obtained in the first two mixed methods studies (Chapters 4 and 5) demonstrated an environment where psychological safety predominated, albeit with identifiable areas where the climate could be improved. Interquartile ranges for these quantitative data indicated agreement across the participant groups, enhancing the robustness of the findings. The presence of psychological safety was confirmed and explored through detailed exploration in qualitative interviews, leading to the generation of novel themes regarding the manifestation of a psychologically safe environment.

Interestingly, there were subtle differences in the manifestation of psychological safety between participant sub-groups and across professional roles. Those occupying more senior roles often offered a different perspective on psychological safety, describing how they created this environment, as well as being affected by its presence. Participants working in the emergency department showed a slightly different pattern of results for the psychological safety assessment than their critical care colleagues, possibly reflecting how organisational and team culture can affect its presence.

The third mixed methods study (Chapter 6) investigated the presence of psychological safety in a different professional group – that of hospital managers. Comparing the results of these studies, it is clear that psychological safety can manifest differently for different elements of the workforce, even when employed within the same workplace environment. Hospital managers described much lower levels of personal psychological safety. This was particularly notable within managerial teams, where participants described difficulty in raising concerns to those more senior within the organisation, especially at the executive level. Additionally, lower levels of psychological safety were described during interactions with clinical colleagues. This raises the question – when clinicians describe cultivating an environment of psychological safety, is this limited to their own team and professional groups, rather than across the organisation? This is an area that warrants further exploration, investigating the presence of psychological safety within smaller teams that contain multiple disciplines, as well

as exploring how managers work and communicate across multiple teams in complex environments such as hospitals.

Consequences of Psychological Safety

An understanding of psychological safety and its benefits were present in all participant groups. Whilst predominantly good levels of psychological safety were demonstrated, particularly in clinical participants, the data were heterogenous enough to allow an appreciation of how varying levels of psychological safety had an impact. Reviewing data across this PhD programme, the consequences of psychological safety can be divided into two distinct groups, according to whether this phenomenon was present or lacking.

Psychological safety present:

Within the evidence synthesis I searched for consequences of a psychologically safe environment as reported in the literature. Of the 9 studies who identified consequences (3.4.2), they were universal in their assertions – low psychological safety led to negative consequences for the working environment, and high psychological safety was associated with positive outcomes, such as improved knowledge sharing.

The possibility that an environment of psychological safety may have undesirable consequences has been raised. As identified at the outset of this PhD programme, exploring for the negative consequences of psychological safety is one of many outstanding queries within this field (37, 38). A recent paper proposes that the relationship between psychological safety climate and dysfunctional team behaviours is directly contingent on the strength of the psychological safety climate (378), creating a theoretical model in which this relationship is moderated by "task interdependence" and "group conflict asymmetry" (reflecting the differing opinions within a team regarding the level of conflict present).

A 2010 study exploring 126 work teams found that teams with high levels of psychological safety were more likely to engage in unethical behaviours (296) as a function of the "risk free" environment. Teams with higher psychological safety were significantly more likely to display cheating behaviour than those with lower, as a climate of psychological safety created an environment where team members felt able to suggest such behaviour without personal risk. Prior to the research contained within this PhD programme, this was the only existing

published study on the potential negative consequences of a psychologically safe environment.

Given the vast number of outstanding research questions regarding psychological safety and the research problem under investigation, exploring potential negative consequences was not an original aim of this research. Instead, it became prominent as a theme through the exploration of participant experiences and a process of qualitative iteration and evaluation. The analyses within this programme identify several negative consequences to psychological safety which are present and consistent across different professional groups and working environments. Data regarding negative consequences to a psychologically safe environment were first identified within critical care staff, with conclusions being supported and expanded as this concept was explored in emergency department staff and hospital managers. These data challenge the assumption that psychological safety is universally beneficial and support a hypothesis that negative consequences can arise as function of a psychologically safe climate itself, rather than being specific to a certain team or environment.

The framework in Figure 38 illustrates the mechanism by which psychological safety can lead to the occurrence of negative consequences.

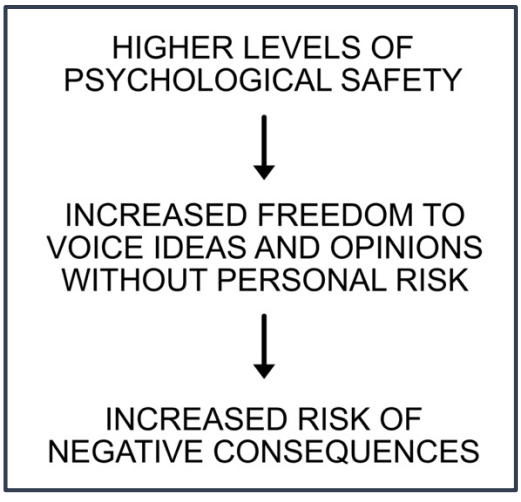


Figure 38. Proposed Framework for the Origin of Negative Consequences of Psychological Safety.

The sequential qualitative analyses in this PhD programme have been compiled to create a composite model (Figure 39). This model highlights the key themes relating to negative consequences and their potential significance for both the individual and the organisation.

Many of these themes were present in all three participant groups, strengthening the robustness of the analysis.

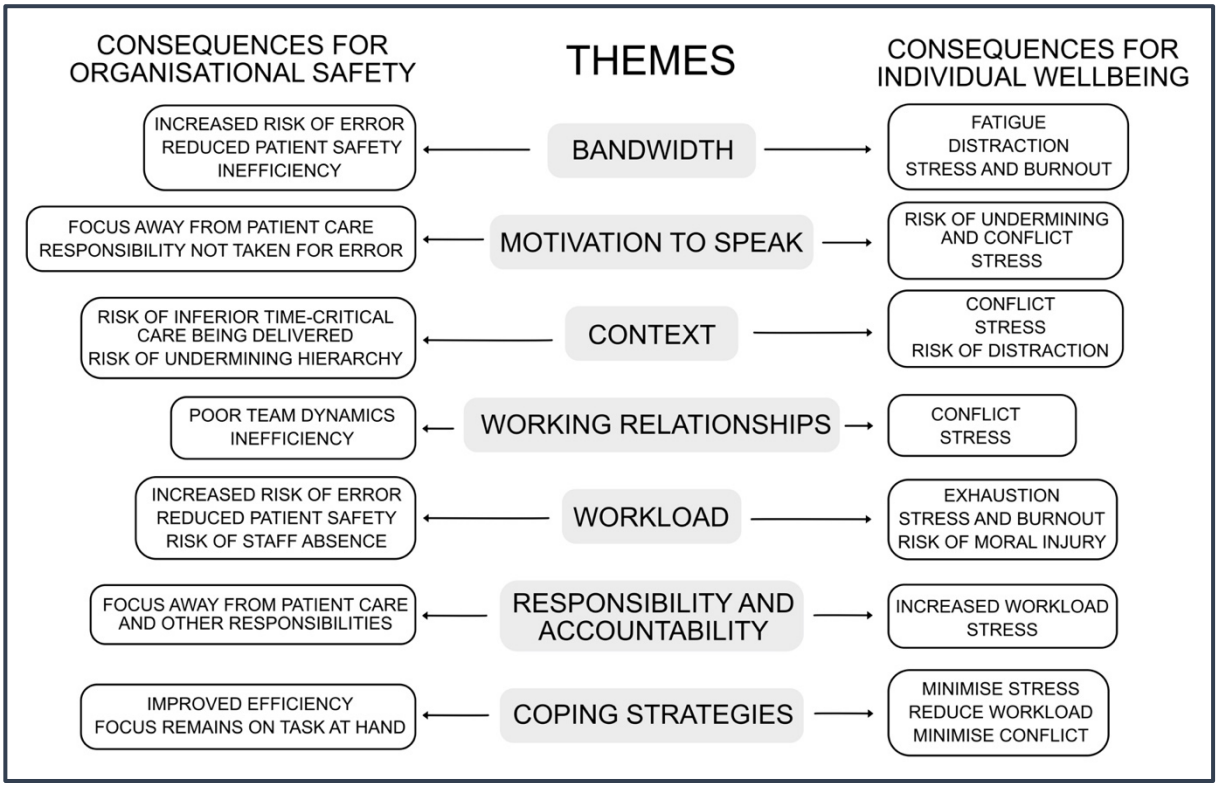


Figure 39. Themes identified within qualitative analyses on the negative consequences to psychological safety, and implications for individual wellbeing and organisational safety.

Of note, the final theme in this model reflects how participants described coping strategies to help manage these consequences, highlighting not only that such consequences are present, but they have an impact on individuals that require modifications to be implemented within the working environment.

This analysis is novel for several reasons. Firstly, it provides a level of detail regarding the presence and manifestation of negative consequences to psychological safety not previously reported. The results of the three studies also demonstrate these negative consequences in the healthcare environment for the first time and demonstrate their occurrence across different settings and varied professional groups.

All three participant groups agreed that these negative consequences did not undermine the presence of psychological safety and remained resolute that a psychologically safe environment was beneficial. Participants described psychological safety as reducing error, improving team dynamics and improving their perception of organisational safety, all corroborating themes present in existing literature. The results of this analysis and resulting model can be used by leaders and applied to their own working environment, as an appreciation of how these negative consequences can arise can lead to the development of mitigation strategies to minimise their occurrence. The challenge here is to encourage and sustain safety and contribution, whilst minimising maladaptive behaviours in a non-destructive way.

Psychological Safety Lacking:

Participants provided vivid descriptions of how a lack of psychological safety can contribute to a blame culture, error, feeling afraid to raise concerns and disrupting team dynamics. Whilst the theme that lacking psychological safety would prevent individuals from raising ideas was present within the data, the predominant focus of participants was upon its effect on safety and error. This focus mirrors conclusions from studies in the airline industry highlighting the importance of psychological safety in encouraging safety improvement efforts (379). These studies particularly note the value of team inclusiveness when minimising the negative effects of a strict hierarchy (380) and enabling more junior team members to speak up and highlight potential error.

A lack of psychological safety was particularly notable within the participant group comprising hospital managers – with marked reluctance to raise concerns to those very senior within the organisation reported. This has significant implications for both organisational safety and an individual's wellbeing. Feeling unable to raise concerns increases the likelihood of error, inhibits any potential for organisational learning and leads to individual frustration, stress and isolation.

Research Question 2: What factors influence a psychologically safe environment within the workforce, with particular focus upon the influence of personality.

The research within this PhD programme provides increased detail to existing knowledge regarding the factors that can influence a psychologically safe environment. These factors take many forms – some are fixed and associated with elements of the workplace environment, whereas others are more nebulous and variable – such as the multitude of factors that contribute to the "context" of any given situation.

These factors were first highlighted within the exploration of facilitators and barriers to an environment of psychological safety during the evidence synthesis (3.4.3.2), and include a manageable workload, the presence of leader inclusiveness, the establishment of common goals within the team and creation of an "open door" policy. These facilitators and barriers were recurrent themes throughout the subsequent qualitative interviews. Understanding these factors within each working environment allow leaders to promote the facilitators and encourage psychological safety. Identifying barriers (such as negative previous experience of speaking up) can also enable team leaders to modify their workplace and create conditions that will promote psychological safety.

The situational context associated with each scenario within the workplace was identified as a significant factor influencing the presence of a psychologically safe environment. This is a novel theme perhaps surprisingly not previously explored in the psychological safety literature. Situational context reflects the variables within an environment (such as organisational culture, the team leader or an individual's confidence) that could influence a climate of psychological safety. Some of these variables will be detrimental to a climate of psychological safety, and awareness of this potential can assist team leaders in mitigating them. These variables are dynamic, and it is possible that the psychological safety associated with each encounter within the working day will be influenced by a different combination. To mitigate the potential negative influence of situational context leaders must have a comprehensive understanding and overview of the entire working environment and adapt their approach as required depending upon each situation.

Two of the research studies within this PhD programme identified the influence of situational context as a major theme within their analysis, with supporting qualitative data provided from the remaining work. This theme was first identified during the thematic analysis within the evidence synthesis, highlighting that multiple contextual factors could be present and would influence psychological safety at the individual, team and organisational level. These factors

can be present in isolation or interact to affect psychological safety. The model created during the evidence synthesis was built upon during qualitative interviews with critical care staff, exploring the concept in detail and providing an increased appreciation for its real-world applicability. The two models have been combined, incorporating themes from both analyses (Figure 40). The breadth of sources (both from the literature and experimental data) increases the likelihood that this model is generalisable across many healthcare setting and can be utilised by team leaders who wish to improve an environment of psychological safety. By adding insights gained from the critical care unit, one of the most challenging and stressful clinical environments, it is unlikely that contextual factors present within other healthcare environments have not been incorporated into this model.

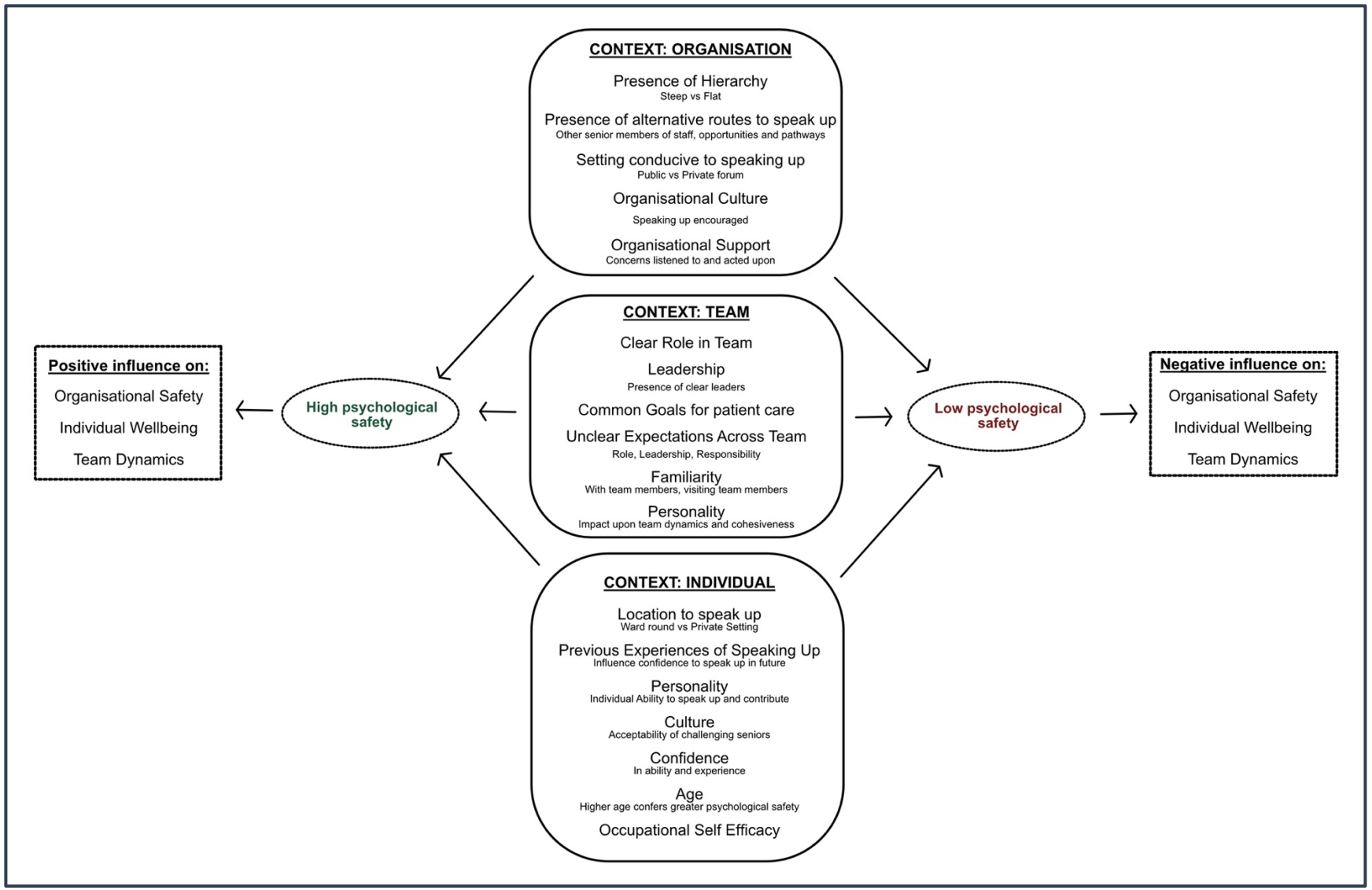


Figure 40. Composite model demonstrating how situational context can influence an environment of psychological safety.

A pre-defined aim of this Thesis was to investigate the influence of personality and predominant personality traits on psychological safety. Whilst a formal assessment of personality was incorporated into one research study (Chapter 5), personality as perceived and described by participants (in the ordinary conversational sense) and its influence on psychological safety was present as a theme within qualitative data across all three mixed methods studies. Interestingly, personality was not identified as a strong theme within the evidence synthesis. This reflects that prior to this research, the influence of personality on psychological safety had not been explored to a significant extent within healthcare workers. Qualitative data highlighted that personality of individual team members could disrupt psychological safety in two ways. Firstly, an individual's personality might result in them finding speaking up difficult. This was reported by participants describing both their own personalities, and what they had observed in the personalities of others within the team. Secondly, the mix of predominant personality traits within the team was described as having the potential to affect team cohesiveness, subsequently affecting an environment of psychological safety.

A hypothesis regarding the association of predominant personality traits with higher levels of psychological safety was tested in the participant group of critical care and emergency workers (Chapter 5). There was evidence of some correlations between predominant personality traits and a higher likelihood of perceiving a climate of psychological safety. More research is required to evaluate the nature of these correlations and whether personality is implicated in the creation of psychological safety, or that some individuals benefit more from a psychologically safe environment.

The consistency of personality as a theme across all three studies support the conclusion that it is important for psychological safety, as well as having a significant impact on team dynamics. The data within these studies support the idea that understanding the personalities of each team member is important, and that the impact of personality on an environment of psychological safety may be more significant in teams who do not achieve this and do not know each other well (34). Appreciating that a heterogeneity of personality types is likely to be present within clinical teams, and this can explain variation in response to environment and clinical challenge seems important for leaders.

Research Question 3: What factors contribute to the presence of stress within the workforce, with particular focus upon the influence of the workplace environment.

It was hypothesised that stress present within the workforce would be detrimental, both for the individual worker and the safety of the organisation itself. This hypothesis was built from an understanding of the existing stress faced by healthcare workers, the impact of such stress on an individual's welfare and potential sequelae of stress (such as increased intention to leave, risk of error and the development of resilience) (79, 81, 90, 97). The perception of stress will be different for each individual, but can be defined simply as the reaction to "feeling threatened or under pressure" (381).

Participant's experiences of stress were explored at length in the qualitative components of all three mixed methods studies, with supporting quantitative data provided from the SAQ (4.3.2.4) and clinical stressors survey (5.3.2.4.1). This exploration incorporated the aetiology of stress, an individual's susceptibility to stress and how stress might manifest. There were two key areas of focus in understanding the aetiology of stress within the workforce – the influence of the workplace environment and the influence of personality. These factors were each studied in depth within a particular study (Chapters 4 and 5 respectively), but the conclusions drawn are supported by qualitative data from all three studies.

The research contained within this PhD programme explores stress arising via two different mechanisms. Firstly, "typical" or "predictable" stressors associated with a "normal" working day and as identified during background research and the clinical stressor literature review (5.3.2.4.1) were evaluated. Secondly, the research captured the impact of a huge and unpredictable stressful event – the COVID-19 pandemic. This second mechanism of stress was not anticipated at the outset of this PhD programme but was serendipitously captured within the data.

The third research question in this Thesis concerned what contributed to the perception of stress within the healthcare workforce under "normal" working circumstances. This exploration consisted of detailed and focused research into the workplace environment, as well as a broader evaluation of general themes associated with stress.

The workplace environment encompasses the physical components of the work setting, but also incorporates many other factors including organisational culture, team dynamics and

workload (58). The Job Demand Control Model (72) was used to interpret how elements of the workplace environment led to stress for an individual worker. The findings of the first qualitative study corresponded to the theory underpinning this model – that lack of control combined with high job demands would result in job strain and stress for individuals (52). This detailed exploration took place with critical care staff as the participant group (4.4.1.3), but was supported by qualitative data in subsequent studies. Both those working in the emergency department and in managerial roles identified similar stressors associated with high demands and low control in the workplace environment – including challenging team dynamics, poor work life balance, limited control over staffing and inadequate skill mix. Fear of error, errors occurring, and an individual's perceived level of responsibility were also themes implicated as causing stress across all participant groups.

The survey exploring the significance of clinical stressors (5.3.2.4.1) also highlighted that high demands and low control – (as associated with high workload, the factor perceived as most stressful by the majority of participants) would lead to stress for individuals. This supports the conclusion that improving the control an individual has over their working day – (for example, giving individuals choice over their allocated tasks) will significantly reduce the incidence and impact of stress.

This Thesis contains the first in depth evaluation of the aetiology and manifestation of stress in hospital managers. Comparing the qualitative data across all participant groups it can be demonstrated how differences in stress manifest in different professional groups within the same healthcare setting, likely as a function of responsibilities, team and role. For example, all groups were negatively affected by heavy workload, but bureaucracy was a significant stressor for those in managerial positions.

Interestingly, organisational culture (particularly with respect to the stress caused by a lack of psychological safety) appeared to have more of an influence on the stress felt by managers than clinicians. This may reflect that junior members in clinical teams are more shielded from negative aspects of organisational culture than those in managerial roles and are able to focus purely on their clinical work. Further research exploring the relative influences of team and organisational culture on an individual worker's stress is warranted, which may direct the focus for future change initiatives.

Personality was associated with the manifestation of stress in several ways. Quantitative data demonstrated a signal that there were correlations between an individual's predominant personality traits and the factors found to be most stressful within their working day (5.4.1). This adds to existing research linking personality traits to levels of reported stress (382), and that personality may influence problem solving and coping strategies (383). Ongoing research is required to explore these correlations further – what is it about particular stressors that makes an individual with certain personality traits more likely to find them stressful?
Qualitative data presented throughout this Thesis supports this correlation, with participants across all groups describing that stress could arise as a function of challenging personalities within the team, and that some personalities were more susceptible to stressful events. In addition, the use of the 16PF personality assessment demonstrated differences between predominant personality traits in those who had chosen to work in the emergency department versus those working in critical care. This may signal that personality has an impact on an individual's ability to cope with the challenges in their working environment, and that those without such personality traits find the same challenges more stressful. This signal may also indicate that different personality types are attracted to different clinical departments – another area where further exploration is warranted in future studies.

The presence of stress in healthcare workers has been investigated extensively. The data presented within this PhD programme build upon this existing work, with novel findings including the detail regarding stress in hospital managers, the linking of stress to personality in healthcare workers, and how stress can manifest in different ways across different professional groups within the same organisation. This is not surprising – different professional groups have varied roles and responsibilities, but knowing and acknowledging the aetiology of each individual's stress should improve mutual understanding and cohesive working relationships. This is particularly relevant at more senior levels of the organisation where different professional disciplines are required to work together to achieve optimal patient care. The stressors identified within the three mixed methods studies have been compiled (Figure 41), highlighting those in common across all professional groups, and those that are specific to either managerial or clinical staff.

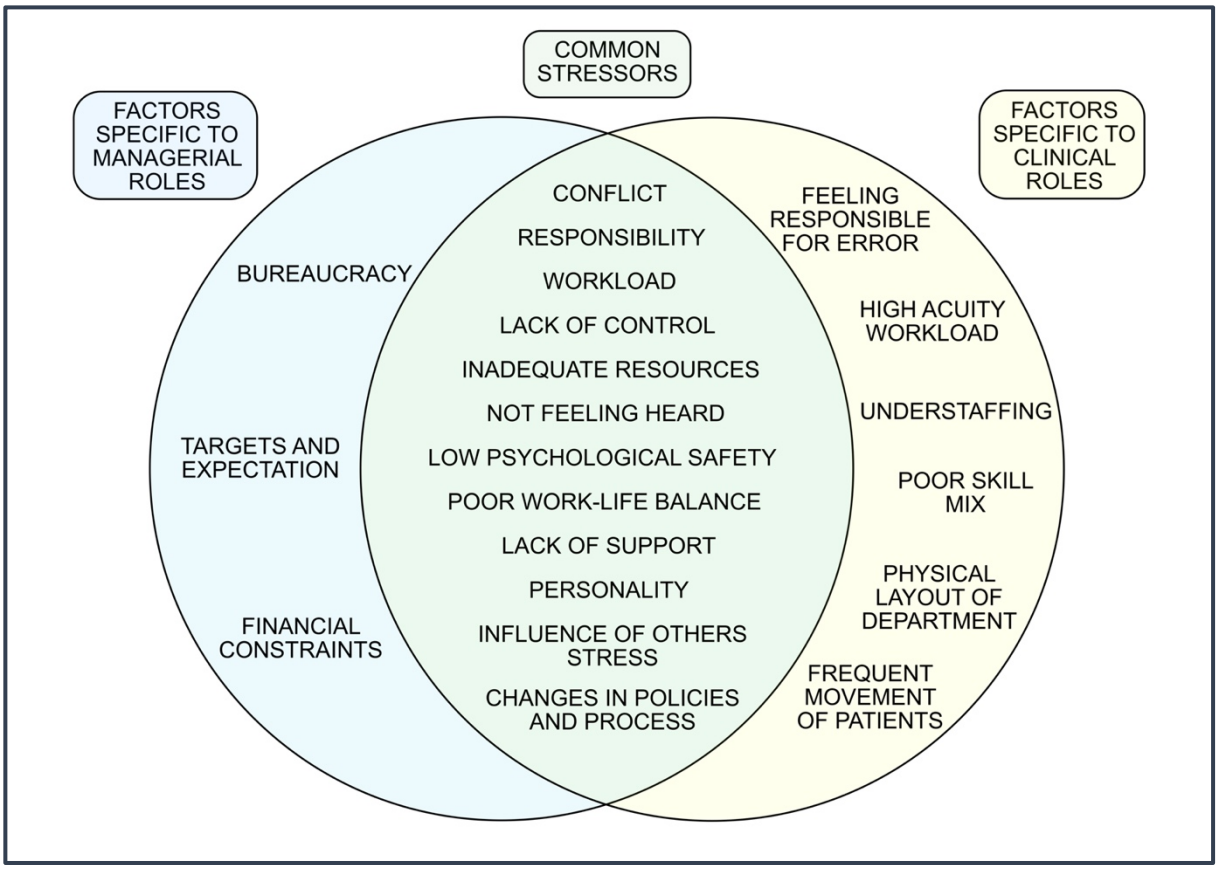


Figure 41. Factors that contribute to an individual's stress in the healthcare environment, according to clinical or managerial roles.

The COVID-19 pandemic provided the opportunity to explore how a large, unexpected and prolonged stressor could affect individuals, and how it changed their working environment. The pandemic significantly affected the second mixed methods study within this PhD programme, both logistically and in terms of the data obtained (5.3.2.1). This qualitative analysis highlighted causative factors that were unique to the pandemic (or that might be seen as a result of a similar extreme stressor), and not present in Figure 41.

These factors included:

- Fear of the unknown
- Personal Risk
- Feelings of isolation
- Requirement to provide increased support to colleagues
- Workload significantly outstripping resources
- New autonomy and requirement for decision making
- Time pressures
- Personal protective equipment

These factors arose from the qualitative data as a function of the iterative analysis approach. However, this is not exhaustive and there may be other stressors affecting these groups which were not directly elicited or discussed by participants.

The breadth of participants and working environments within the three mixed method studies suggests these data on the aetiology and manifestation of stress is likely to be generalisable across other healthcare departments with similar pressures and challenges.
Addressing stress in healthcare workers and its potential psychological sequelae has multiple challenges. Some stressors are not modifiable, such as the level of patient acuity, dealing with death or the volume of patients that require inpatient care. It is therefore prudent for team leaders to focus upon modifiable organisational factors that can be improved to minimise stress. These will be specific to each organisation (and likely to individual departments within organisations) but may include ensuring adequate staffing levels or influencing a change in the organisational culture to one where speaking up is encouraged.

Research Question 4: How do psychological safety and stress impact individual wellbeing and organisational safety?

The fourth research question in this Thesis aimed to answer what the impact of psychological safety and stress were on individual workers and the safety of the wider organisation.

The Impact of Psychological Safety

The focus upon staff experiences of psychological safety within the evidence synthesis yielded a wealth of data on the factors that influence such a climate. However, the included papers provided very little evaluation of how described participant experiences impacted their wellbeing. For example, data provided descriptors of low psychological safety, such as "*there is nowhere to turn. They just laugh at you or look through you" (274)* but it remains up to the reader to interpret whether this is a scenario that would cause stress for an individual.

The qualitative components within all three mixed methods studies aimed to explore the impact of psychological safety on an individual's wellbeing in more depth. The impact of psychological safety (whether present or lacking) was explored during discussions on

psychological safety and safety. Qualitative themes across all three analyses have been reviewed to create a higher order theme demonstrating the impact of psychological safety on an individual's wellbeing. Positive and negative implications are outlined in Table 21.

Table 21. The impact of psychological safety on an individual's wellbeing.

High Levels of Psychological Safety	Low Levels of Psychological Safety
Confidence	Feeling 'intimidated'
Empowerment	Feeling 'silenced'
Feeling 'in control'	Worried errors will occur
Satisfaction from closer team relationships	Perception of 'lack of control'
Reduced Anxiety	Stress and psychological distress
Feeling 'understood'	Reduced learning and personal development
Feeling 'supported'	Not feeling 'valued'
*Fatigue and distraction**	Contribution to feelings of 'inadequacy' and risk of moral injury
	Risk of feeling 'undermined'
	Feeling 'unsupported'

*These factors highlight the potential impact of the negative consequences of high psychological safety on an individual as identified within the qualitative analyses.

A safe healthcare organisation is crucial for minimising errors, operational efficiency and delivering a high standard of care to patients. Data regarding organisational safety collected in the qualitative analyses across this PhD programme were re-reviewed and collated to generate a higher order theme. This provided increased detail on how psychological safety can impact organisational safety, depending upon the level to which it is present. Key impacts are shown in Table 22.

Table 22. The impact of psychological safety on organisational safety.

High Levels of Psychological Safety	Low Levels of Psychological Safety
Reduced error and near misses	Higher rates of error
Creation of an open culture to report errors	Predominance of a blame culture
Increased collaboration	Reduced organisational learning
Improved service delivered to patients	Reduced quality of service delivered
Improved efficiency	Service not delivered
Enhanced organisational learning	
*Risk of reduced safety and efficiency**	

*These factors highlight the potential impact of the negative consequences of high psychological safety identified within the qualitative analyses.

The Impact of Stress

Building upon the increased understanding of what factors caused stress within the healthcare environment (7.3), the qualitative analyses within the mixed methods studies facilitated an exploration into what the subsequent impact of this stress might be.

As highlighted in 7.3, there were two main mechanisms through which stress was created – those seen in "normal" working life, and those caused by an "extreme" and unexpected stressor, the COVID-19 pandemic. These two mechanisms demonstrated differences in their effect. Interestingly, the more "typical" stressors and their impact were universally viewed negatively, causing individual distress, disrupting teamwork and risking organisational safety. However, stress associated with the pandemic had a heterogeneous impact – with both positive and negative effects being described. This insight may allow team leaders to promote the more beneficial sequelae of stress (such as increased camaraderie), whilst mitigating the more negative sequalae (such as psychological distress) by providing support and encouragement as required.

The analysis presented in Chapter 5.6 highlighted a possible outcome of extreme stress not seen in the other studies – that extremely challenging working conditions where individuals are forced to work beyond their comfort zone and work in a manner which goes against their beliefs about what is "correct" can lead to the occurrence of moral injury. This manifestation of moral injury may be an extension of psychological distress observed in other qualitative data – in which participants described feeling inadequate as a result of "normal" challenging working conditions (4.4.1.3.1).

The incidence of moral injury and its consequences are an area of continuing research, particularly in healthcare workers. It is an important consequence of extreme stress and challenging conditions that team leaders must be aware of in times of crisis. This awareness will allow adequate support to be provided for individuals when being asked to work outside of their usual systems, particularly if this could be perceived as being forced to deliver sub-optimal care to their patients.

The qualitative analyses in all three mixed methods studies were re-reviewed to highlight the potential consequences of stress for both the individual and the safety of the organisation (Table 23). Quantitative data from the SAQ (4.4.1.2.1.1) supported these qualitative themes (particularly within the stress recognition climate) – with participants stating that conflict within the team could lead to errors, and that excessive workload and fatigue would impair performance.

Table 23. The impact of stress on individual wellbeing and organisational safety.

Individual Wellbeing	Organisational Safety
Presence of psychological distress including: - Depression / Low mood - Anxiety - Burnout Moral injury (response to extreme stressor) Feelings of frustration Feeling unsupported Feelings of inadequacy Reduced morale Displaying risk-averse behaviours More likely to engage in conflict Resilient Individuals	Higher risk of error and reduced patient safety Reduced organisational learning Impaired team dynamics including: - Reduced teamwork - Reduced camaraderie - Reduced team morale Reduced workforce numbers Resilient organisation

The consequences of stress were typically detrimental for both an individual's wellbeing and the safety of the organisation, highlighting how important it is to identify causative factors, apply process change to mitigate these, and support individuals adequately when stress occurs.

One arguably "positive" consequence of stress was the development and manifestation of resilience, as demonstrated and explored within the study on hospital managers (6.3.2.2). This is the first study exploring resilience in hospital managers themselves. Given that organisational challenge and the presence of stressors was described consistently across all participant groups, it is likely that resilience is beneficial for all those working in the healthcare environment. The presence of resilient individuals will have benefits for their own wellbeing, as well as promoting resilience of the organisation – allowing it to continue to function well

in times of challenge. The resilience described by participants in this study was developed through exposure to repeated stresses and challenges, rather than through techniques designed to teach and promote resilience (such as facilitating controlled decision making and focusing upon building strong relationships in the workplace) (384-386). More research regarding the longer-term consequences of resilience developed through repeated stress is required, and whether this differs from resilience developed through more positive methods.

7.2.IMPORTANCE OF THE RESEARCH

The research in this PhD programme consists of a thorough exploration of the workplace environment, focusing upon staff stress and psychological safety. It was proposed that by understanding these phenomena (namely what contributed to their existence and what their influence was) solutions could be developed that would allow leaders to promote psychological safety and reduce the stress felt by healthcare workers.

This Thesis contains several novel findings and explores phenomena including as stress and psychological safety in some professional groups for the first time.

The potential impact of this research is twofold. Firstly, the data generated regarding the negative consequences of psychological safety makes a significant contribution to the evolving psychological safety literature, answering a question posed within several systematic reviews.

The second impact of this research is in its potential application within the healthcare environment to improve psychological safety and minimise the presence of stressors. The data within this Thesis is broad, covering both “normal” and “extreme” stressors, and how stress and psychological safety can manifest in different working environments and across different professional groups.

The models and frameworks developed through extensive thematic analyses can be implemented to improve psychological safety, reduce staff stress and improve team dynamics – promoting cohesive working relationships. It is anticipated that this will encourage individual wellbeing and promote a culture organisational safety.

7.2.1. PLAN FOR DISSEMINATION OF RESULTS

The findings of this PhD programme have been presented both locally and internationally and published in peer review journals. There is an ongoing intention to publish and present the remaining work.

The results of all studies in this Thesis have been presented locally to my research group, and the clinical departments involved in each study.
I have attended several international conferences, with the findings of the evidence synthesis presented at the Applied Human Factors and Ergonomics Conference in July 2020. The findings of the mixed methods exploration into psychological safety in critical care (4.4.1.1) were presented at the European Society of Intensive Care Medicine's annual conference in December 2020 and the analyses of the impact of the workplace environment (4.4.1.3) at the Human Factors and Ergonomics Society annual conference in April 2021.
It is intended that the results of both the investigation into personality and stress in managers will be presented at international conferences in the coming months.

In addition to the publication of both preliminary studies (64, 292) the work within this Thesis has been accepted for publication in several peer reviewed journals:

- The evidence synthesis was published in BMC Health Services research (46)
- The qualitative exploration into psychological safety within critical care staff was published in PLOS One (293)
- The detailed qualitative evaluation of frontline staff's experiences of the COVID-19 pandemic has been published in BMJ Open (334)
- The influence of the working environment on critical care staff has been published in Human Factors in Healthcare (52)

Manuscripts for the remaining two analyses are being prepared. It is intended to submit the results of the personality analysis to PLOS One, and the results of the managers study to BMC Health Services Research.

I also intend to publish an article summarising the negative consequences of psychological safety as identified within all three mixed methods studies.

7.3. OVERALL LIMITATIONS

Limitations associated with each research study in this Thesis have been described within the corresponding chapter.

All studies within this Thesis risk recruitment bias, as those with an interest in the focus of each study (be that safety, psychological safety, stress or personality) may have been more inclined to participate in the studies. This is mitigated by the use of purposive sampling and thorough assessments of thematic saturation, but it is possible that there are individual stories and perceptions of the workplace environment which have not been captured by this research.

Purposive sampling, whilst justified within this research to ensure participant groups reflected the composition of the workplace being investigated, meant that some sub-groups were not represented proportionally. For example, physiotherapists within the critical care environment are much smaller in number than their nursing counterparts. As such it was not possible to perform detailed subgroup analyses exploring whether the presence of psychological safety or stress were significantly different between members of the multi-disciplinary team. This limitation provides an opportunity for future studies, investigating the presence of psychological safety or stress and whether there are differences in their manifestation in team members of different disciplines.

All studies within this PhD programme utilised mixed methodology, with an emphasis on qualitative data during the analyses and conclusions made. Qualitative research is not typically intended to be generalisable, but to provide in depth explanation and meaning of phenomena within specific participant groups. Data obtained within the two studies on clinical staff provide a broad and detailed account of how individuals perceive their working environment, resulting in insights as to how psychological safety and stress could be

improved. Whilst not designed with generalisability as a primary objective, it is very feasibile that similar clinical environments will create similar working conditions, and as such these insights will be applicable to other clinical teams.

Data obtained regarding stress, psychological safety and resilience within the managers study provide great insight into their working conditions, challenges and working relationships. The quality and quantity of the data provide confidence that the themes constructed accurately reflect the experiences of hospital managers within the NHS trust studied. Again, whilst not designed to be generalisable, it is likely that these themes will be applicable to other similar NHS organisations, and can be used as a starting point for ongoing investigation. The qualitative data in these studies also provides a provisional explanation for behaviours within the study population.

Whilst the findings of the research in this PhD may have broader resonance, the results must be considered locally within the participant population. These data can be used to frame questions and facilitate the development of quality improvement projects and educational tools for ongoing utilisation within the study environments.

As all studies took place in the same NHS trust, comparators between managers and clinicans have been drawn, particularly with reference to perceived levels of psychological safety. The studies within this PhD programme were not designed with direct comparison in mind, however the differences observed provide a rationale for future investigation.

The requirement to convert the conduct of research encounters with participants to a virtual platform after March 2020 was a success. However, there is a possibility that the environment in which virtual interviews were conducted may have influenced the participants perception. Those interviewed at home in a familiar and more relaxed environment (without work-based environmental cues) may have responded differently to those interviewed in their place of work. This could be mitigated in future studies ensuring that all participants were interviewed in the same environment.

7.4. OPPORTUNITIES FOR FUTURE WORK

The analyses and discussions within each study chapter highlight many opportunities for future research studies, building upon the work presented within this Thesis.

In answering the research questions within this Thesis, all the studies developed frameworks and models that can be used to improve a culture of psychological safety and minimise individual stress. These concepts and potential for change could be incorporated into management and leadership training for those working in the healthcare setting.

It would be interesting to test these models in vivo. Working with team leaders, an ethnographic study could be undertaken to observe working relationships, possibly combined with qualitative interviews to assess psychological safety and staff perceptions of stress and team dynamics. These data could then be mapped to the frameworks (for example, the influence of situational context (7.1), or measures to improve decision latitude (4.4.1.3.1)), using these to identify suitable foci for modification. Solutions to any identified issues (for example, providing clear and signposted times to raise concerns during a ward round, or improvement of an individual's control over their working day by involving them in task allocation decisions) could then be implemented using quality improvement methodology, with follow up ethnographic studies and interviews to ascertain if psychological safety and team dynamics had been improved.

It would also be possible to implement a reflective feedback model to assess and review organisational culture, using staff experiences (gained through observation and interviews) to stimulate reflection and learning in participants occupying leadership positions.

In addition to utisiling the frameworks and models developed in this PhD programme as foci for intervention design, they could be used to evaluate the presence and manifestation of phenomena in other healthcare environments. The thematic framework constructed during the study on hospital managers could be used to design a deductive qualitative analysis in other sites. This may support and refine the conclusions made within this Thesis – helping to identify whether the manifestations of psychological safety and stress seen in this study are present in less acute healthcare settings or those with different geographical contraints (for example inner city hospitals versus rural sites).

The three mixed methods studies within this thesis all reported on the incidence of psychological distress (such as anxiety, stress, depression and burnout) as reported by the participants. It would be useful to develop this theme further, designing a mixed methods study which correlated the presence of these conditions as explored with qualitative methods with a validated quantitative assessment, such as the Maslach Burnout Inventory (2). This would provide a quantifiable metric which could be repeatedly assessed following the implementation of measures that aimed to improve psychological safety and reduce stress within the workplace environment. Specific measures that could be implemented to reduce psychological distress could include the provision of dedicated mental health support,
It would also be possible to design interventions aimed to reduce job stain as highlighted using the job demand control model. These could include providing an opportunity for nurses to have input into their allocated role for the shift or the location in which they will be based.

Several correlations were identified within the personality study that warrant further investigation. The data within this study signalled a correlation between psychological safety, stress, chosen professional role and the predominant personality types displayed by an individual. It would be interesting to interrogate these further – increasing understanding of how personality can influence both an individual and team dynamics within the workplace environment.
It would also be possible to develop a pilot study evaluating the potential benefits of using personality assessments such as the 16PF as a mentoring / coaching tool. The aims of such a study would be to ascertain whether understanding an individual's susceptibility to stressful events can be better managed through knowledge of its aetiology. It is envisioned that this would help both individuals in coping with stress (by recognising what they are more likely to find stressful), and team leaders in supporting their teams.

Finally, it would be prudent to explore the manifestation of negative consequences of a psychologically safe environment in other settings – both within healthcare and in other industries. This would help further understand the aetiology of these consequences and enhance the generalisability of the study findings within this Thesis.

The approach to analysis of qualitative research within this Thesis was inductive, with results and themes being driven by the data. These data can be used to form frameworks for subsequent deductive analyses, using these frameworks to identify the presence of negative consequences in other workplace environments.

7.5.CONCLUSIONS

The data and analyses within this PhD programme highlight how a psychologically safe environment is viewed by those working in the healthcare setting as helping to minimise the incidence of error and contribute to a positive and fulfilling working environment. As such it is likely that a psychologically safe environment will help to promote individual wellbeing and enhance organisational safety. In addition, the data provide a deeper understanding of the manifestation and consequences of stress in the healthcare environment. Both the detail provided through in depth qualitative analyses and the development of several models and frameworks that promote psychological safety and minimise stress are novel contributions to the literature. These models and frameworks can be used by healthcare leaders to improve the working environment. It is proposed that by creating well-managed psychological safety and minimising the occurrence and impact of stress, the problems associated with an insufficient and drained workforce and ongoing medical error might be mitigated. In addition, the research makes a significant contribution to the ongoing understanding of psychological safety – in the form of details regarding the possible negative consequences of such an environment. Understanding both the benefits and negatives of psychological safety can only further empower leaders when aiming to create a cohesive, safe and efficient working environment.

The large body of data within this PhD programme describe staff experiences, highlighting what they perceive as important for teamwork, safety and a cohesive working environment. Participants described conditions that facilitated psychological safety positively, suggesting that promoting such a culture will enhance job satisfaction and help to ensure longevity within the workforce. All the studies contained within this Thesis kept staff experiences and perceptions at the centre of the analyses. It is imperative when aiming to mitigate concerns

regarding staff welfare and increased intention to leave that these individual experiences remain heard and acted upon.

REFERENCES

1. Salvagioni DAJ, Melanda FN, Mesas AE, González AD, Gabani FL, Andrade SMd. Physical, psychological and occupational consequences of job burnout: A systematic review of prospective studies. PloS one. 2017;12(10):e0185781.
2. Maslach C, Jackson SE, Leiter MP. Maslach burnout inventory: Scarecrow Education; 1997.
3. Grober ED, Bohnen JM. Defining medical error. canadian Journal of Surgery. 2005;48(1):39.
4. Reason J. Managing the management risk: New approaches to organisational safety. Reliability and safety in hazardous work systems. 1993:7-22.
5. Reason J. Understanding adverse events: human factors. BMJ Quality & Safety. 1995;4(2):80-9.
6. Drapeau A, Marchand A, Beaulieu-Prévost D. Epidemiology of psychological distress. Mental illnesses-understanding, prediction and control. 2012;69(2):105-6.
7. Fund TKs. NHS funding: our position 2021 [Available from: https://www.kingsfund.org.uk/projects/positions/nhs-funding.
8. Plan N. The NHS Long Term Plan 2020 [Available from: https://www.longtermplan.nhs.uk/publication/nhs-long-term-plan/.
9. Statistics N. NHS Workforce Statistics - January 2021 (Including selected provisional statistics for February 2021) - NHS Digital 2021 [Available from: https://digital.nhs.uk/data-and-information/publications/statistical/nhs-workforce-statistics/january-2021.
10. England N. Interim NHS People Plan 2019 [Available from: https://www.longtermplan.nhs.uk/wp-content/uploads/2019/05/Interim-NHS-People-Plan_June2019.pdf.
11. England N. We are the NHS: People Plan 2020/21 2020 [Available from: https://www.england.nhs.uk/wp-content/uploads/2020/07/We-Are-The-NHS-Action-For-All-Of-Us-FINAL-March-21.pdf.
12. England N. National results across the NHS in England | NHS Staff Survey 2020 [Available from: https://www.nhsstaffsurveys.com/results/national-results/.
13. Finlayson B. Counting the Smiles: Morale and Motivation in the NHS: King's Fund London; 2002.
14. Perlo J, Balik B, Swenson S, Kabcenell A, Landsman J, Feeley D. IHI framework for improving joy in work. 2017.
15. Shanafelt TD, Hasan O, Dyrbye LN, Sinsky C, Satele D, Sloan J, et al., editors. Changes in burnout and satisfaction with work-life balance in physicians and the general US working population between 2011 and 2014. Mayo clinic proceedings; 2015: Elsevier.
16. Fund TKs. Critical care services in the English NHS 2020 [Available from: https://www.kingsfund.org.uk/publications/critical-care-services-nhs
.
17. Fund TKs. The changing role of managers in the NHS 2014 [Available from: https://www.kingsfund.org.uk/publications/future-leadership-and-management-nhs/changing-role-of-NHS-managers.
18. Parand A, Dopson S, Renz A, Vincent C. The role of hospital managers in quality and patient safety: a systematic review. BMJ Open. 2014;4(9):e005055.
19. Barati O, Sadeghi A, Khammarnia M, Siavashi E, Oskrochi G. A Qualitative Study to Identify Skills and Competency Required for Hospital Managers. Electron Physician. 2016;8(6):2458-65.

20. Kakemam E, Liang Z, Janati A, Arab-Zozani M, Mohaghegh B, Gholizadeh M. Leadership and Management Competencies for Hospital Managers: A Systematic Review and Best-Fit Framework Synthesis. J Healthc Leadersh. 2020;12:59-68.
21. Kessel M, Kratzer J, Schultz C. Psychological safety, knowledge sharing, and creative performance in healthcare teams. Creativity and innovation management. 2012;21(2):147-57.
22. Brown SP, Leigh TW. A new look at psychological climate and its relationship to job involvement, effort, and performance. Journal of applied psychology. 1996;81(4):358.
23. Schein E, Bennis WG. Personal and organizational change through group methods: The laboratory approach. New York: JohnWiley and Sons: Inc; 1965.
24. Neave HR. Deming's 14 points for management: framework for success. Journal of the Royal Statistical Society: Series D (The Statistician). 1987;36(5):561-70.
25. Kahn WA. Psychological conditions of personal engagement and disengagement at work. Academy of management journal. 1990;33(4):692-724.
26. Edmondson A. Psychological Safety and Learning Behavior in Work Teams. Administrative Science Quarterly. 1999;44(2):350-83.
27. Baer M, Frese M. Innovation is not enough: climates for initiative and psychological safety, process innovations, and firm performance. Journal of Organizational Behavior. 2003;24(1):45-68.
28. Edmondson AC, Lei Z. Psychological safety: The history, renaissance, and future of an interpersonal construct. Annu Rev Organ Psychol Organ Behav. 2014;1(1):23-43.
29. Rother M. Toyota Kata: Managing people for improvement, adaptiveness and superior results: MGH, New York; 2019.
30. Rework with Google [Available from: https://rework.withgoogle.com/print/guides/5721312655835136/.
31. Review HB. Boeing and the Importance of Encouraging Employees to Speak Up [Available from: https://hbr.org/2019/05/boeing-and-the-importance-of-encouraging-employees-to-speak-up.
32. Abramova V. What needs to be changed based on lessons learned from Chernobyl. Human and Organizational Aspects of Assuring Nuclear Safety—Exploring 30 Years of Safety Culture. 2016;22:81.
33. Cordery J, Soo C, Kirkman B, Rosen B, Mathieu J. Leading Parallel Global Virtual Teams:: Lessons from Alcoa. Organizational Dynamics. 2009;38(3):204-16.
34. Edmondson A, Higgins M, Singer S, Weiner J. Understanding Psychological Safety in Health Care and Education Organizations: A Comparative Perspective. Research in Human Development. 2016;13:65-83.
35. Nembhard IM, Edmondson AC. Making it safe: the effects of leader inclusiveness and professional status on psychological safety and improvement efforts in health care teams. Journal of Organizational Behavior. 2006;27(7):941-66.
36. Edmondson AC. Learning from failure in health care: frequent opportunities, pervasive barriers. BMJ Quality & Safety. 2004;13(suppl 2):ii3-ii9.
37. Frazier ML, Fainshmidt S, Klinger RL, Pezeshkan A, Vracheva V. Psychological safety: A meta-analytic review and extension. Personnel Psychology. 2017;70(1):113-65.
38. Newman A, Donohue R, Eva N. Psychological safety: A systematic review of the literature. Human Resource Management Review. 2017;27(3):521-35.
39. Ruck K, Welch M, Menara B. Employee voice: an antecedent to organisational engagement? Public Relations Review. 2017;43(5):904-14.

40. Brown DN. Facilitating changes in the practice context: using action research to uncover the significance of psychological safety-an example from pain management with older people: University of Ulster; 2008.
41. Lateef F. Maximizing learning and creativity: Understanding psychological safety in simulation-based learning. Journal of emergencies, trauma, and shock. 2020;13(1):5.
42. Sexton JB, Thomas EJ, Helmreich RL. Error, stress, and teamwork in medicine and aviation: cross sectional surveys. BMJ (Clinical research ed). 2000;320(7237):745-9.
43. Flin R, Maran N. Identifying and training non-technical skills for teams in acute medicine. Quality and Safety in Health Care. 2004;13(suppl 1):i80.
44. Green B, Oeppen RS, Smith DW, Brennan PA. Challenging hierarchy in healthcare teams - ways to flatten gradients to improve teamwork and patient care. Br J Oral Maxillofac Surg. 2017;55(5):449-53.
45. Reason J. Human error: models and management. Bmj. 2000;320(7237):768-70.
46. Grailey KE, Murray E, Reader T, Brett SJ. The presence and potential impact of psychological safety in the healthcare setting: an evidence synthesis. BMC Health Services Research. 2021;21(1):773.
47. Kohn LT, Corrigan JM, Donaldson MS, McKay T, Pike K. To err is human. building a safer health system. 2000;600:2000.
48. AHA Hospital Statistics, 2018 Edition: Health Forum LLC 2018.
49. NHS Staff Survey Results 2017 [Available from: www.england.nhs.uk/2017/03/staff-survey/
50. Strategies C. Malpractice risk in communication failures. 2015 Annual Benchmarking Report 2015.
51. Thomas EJ, Sexton JB, Helmreich RL. Discrepant attitudes about teamwork among critical care nurses and physicians. Critical care medicine. 2003;31(3):956-9.
52. Grailey K, Leon-Villapalos C, Murray E, Brett SJ. The Psychological Impact of the Workplace Environment in Critical Care A Qualitative Exploration. Human Factors in Healthcare. 2021:100001.
53. Edmondson AC, Roloff KS. Overcoming barriers to collaboration: Psychological safety and learning in diverse teams. Team effectiveness in complex organizations: Routledge; 2008. p. 217-42.
54. Kobayashi H, Pian-Smith M, Sato M, Sawa R, Takeshita T, Raemer D. A cross-cultural survey of residents' perceived barriers in questioning/challenging authority. Qual Saf Health Care. 2006;15(4):277-83.
55. Aranzamendez G, James D, Toms R, editors. Finding antecedents of psychological safety: A step toward quality improvement. Nursing forum; 2015: Wiley Online Library.
56. Torralba KD, Jose D, Byrne J. Psychological safety, the hidden curriculum, and ambiguity in medicine. Clinical rheumatology. 2020;39(3):667-71.
57. Busse C, Kach AP, Wagner SM. Boundary conditions: What they are, how to explore them, why we need them, and when to consider them. Organizational Research Methods. 2017;20(4):574-609.
58. Briner RB. Relationships between work environments, psychological environments and psychological well-being. Occupational medicine. 2000;50(5):299-303.
59. Joseph A. The role of the physical and social environment in promoting health, safety, and effectiveness in the healthcare workplace. Concord, CA: The Center for Health Design. 2006.

60. van den Oetelaar WFJM, van Stel HF, van Rhenen W, Stellato RK, Grolman W. Balancing nurses' workload in hospital wards: study protocol of developing a method to manage workload. BMJ open. 2016;6(11):e012148-e.
61. Virtanen M, Kurvinen T, Terho K, Oksanen T, Peltonen R, Vahtera J, et al. Work Hours, Work Stress, and Collaboration among Ward Staff in Relation to Risk of Hospital-Associated Infection among Patients. Medical Care. 2009;47(3):310-8.
62. Jennings BM. Work stress and burnout among nurses: Role of the work environment and working conditions. Patient safety and quality: An evidence-based handbook for nurses: Agency for Healthcare Research and Quality (US); 2008.
63. D'Lima DM, Murray EJ, Brett SJ. Perceptions of Risk and Safety in the ICU: A Qualitative Study of Cognitive Processes Relating to Staffing. Critical Care Medicine. 2018;46(1):60-70.
64. Grailey K, Murray E, Billings J, Brett S. How do critical care staff respond to organisational challenge? A qualitative exploration into personality types and cognitive processing in critical care. PloS one. 2020;15(1):e0226800.
65. Chaudhury H, Mahmood A, Valente M. Advantages and disadvantages of single-versus multiple-occupancy rooms in acute care environments: a review and analysis of the literature. Environment and Behavior. 2005;37(6):760-86.
66. Henriksen K, Isaacson S, Sadler BL, Zimring CM. The role of the physical environment in crossing the quality chasm. The Joint Commission Journal on Quality and Patient Safety. 2007;33(11):68-80.
67. Maben J, Griffiths P, Penfold C, Simon M, Pizzo E, Anderson J, et al. Evaluating a major innovation in hospital design: workforce implications and impact on patient and staff experiences of all single room hospital accommodation. 2015.
68. Maben J, Griffiths P, Penfold C, Simon M, Anderson JE, Robert G, et al. One size fits all? Mixed methods evaluation of the impact of 100% single-room accommodation on staff and patient experience, safety and costs. BMJ quality & safety. 2016;25(4):241-56.
69. Donetto S, Penfold C, Anderson J, Robert G, Maben J. Nursing work and sensory experiences of hospital design: A before and after qualitative study following a move to all-single room inpatient accommodation. Health & Place. 2017;46:121-9.
70. Tanja-Dijkstra K, Pieterse ME. The psychological effects of the physical healthcare environment on healthcare personnel. Cochrane database of systematic reviews. 2011(1).
71. Alves MG, Hökerberg YH, Faerstein E. [Trends and diversity in the empirical use of Karasek's demand-control model (job strain): a systematic review]. Rev Bras Epidemiol. 2013;16(1):125-36.
72. Karasek Jr RA. Job demands, job decision latitude, and mental strain: Implications for job redesign. Administrative science quarterly. 1979:285-308.
73. Raziq A, Maulabakhsh R. Impact of working environment on job satisfaction. Procedia Economics and Finance. 2015;23:717-25.
74. Landsbergis PA. Occupational stress among health care workers: a test of the job demands-control model. Journal of Organizational behavior. 1988;9(3):217-39.
75. Fox ML, Dwyer DJ, Ganster DC. Effects of stressful job demands and control on physiological and attitudinal outcomes in a hospital setting. Academy of Management journal. 1993;36(2):289-318.
76. Jonge JD, Janseen PP, Van Breukelen GJ. Testing the demand-control-support model among health-care professionals: A structural equation model. Work & Stress. 1996;10(3):209-24.
77. Kanter RM. Men and women of the corporation Basic Books. New York. 1977.

78. Kanter RM. Men and women of the corporation (2nd reprint of 1993 edition). New York, NY: Basic Books; 1997.
79. Ruotsalainen J, Verbeek J, Marine A. an Seera, C.(2015). Preventing occupational stress in healthcare workers. Cochrane Database of Systematic Reviews.4:1-117.
80. Peterson C. Stress among health care workers. Journal of Occupational Health and Safety, Australia and New Zealand. 2003;19(1):49-58.
81. Chiang Y-M, Chang Y. Stress, depression, and intention to leave among nurses in different medical units: Implications for healthcare management/nursing practice. Health Policy. 2012;108(2-3):149-57.
82. Fiabane E, Giorgi I, Sguazzin C, Argentero P. Work engagement and occupational stress in nurses and other healthcare workers: the role of organisational and personal factors. Journal of clinical nursing. 2013;22(17-18):2614-24.
83. Inoue KC, Versa GLGdS, Murassaki ACY, Melo WAd, Matsuda LM. Occupational stress in intensive care nurses who provide direct care to critical patients. Revista brasileira de enfermagem. 2013;66(5):722-9.
84. SHREE M, ALAGESAN MS. A study on factors causing stress among doctors. Journal of Contemporary Issues in Business and Government. 2020;26(2):764-8.
85. Trifunovic N, Jatic Z, Kulenovic AD. Identification of causes of the occupational stress for health providers at different levels of health care. Medical Archives. 2017;71(3):169.
86. Yamaguchi Y, Inoue T, Harada H, Oike M. Job control, work-family balance and nurses' intention to leave their profession and organization: A comparative cross-sectional survey. International journal of nursing studies. 2016;64:52-62.
87. Schaufeli WB, Bakker AB, Hoogduin K, Schaap C, Kladler A. On the clinical validity of the Maslach Burnout Inventory and the Burnout Measure. Psychology & health. 2001;16(5):565-82.
88. Teixeira C, Ribeiro O, Fonseca AM, Carvalho AS. Ethical decision making in intensive care units: a burnout risk factor? Results from a multicentre study conducted with physicians and nurses. Journal of medical ethics. 2014;40(2):97-103.
89. Snibbe JR, Radcliffe T, Weisberger C, Richards M, Kelly J. Burnout among primary care physicians and mental health professionals in a managed health care setting. Psychological reports. 1989;65(3):775-80.
90. Abraham A, Chaabna K, Doraiswamy S, Bhagat S, Sheikh J, Mamtani R, et al. Depression among healthcare workers in the Eastern Mediterranean Region: a systematic review and meta-analysis. Human resources for health. 2021;19(1):1-18.
91. Dyrbye LN, West CP, Satele D, Boone S, Tan L, Sloan J, et al. Burnout among US medical students, residents, and early career physicians relative to the general US population. Academic Medicine. 2014;89(3):443-51.
92. West CP, Dyrbye LN, Erwin PJ, Shanafelt TD. Interventions to prevent and reduce physician burnout: a systematic review and meta-analysis. Lancet. 2016;388(10057):2272-81.
93. Wong CA, Laschinger HKS. The influence of frontline manager job strain on burnout, commitment and turnover intention: A cross-sectional study. International journal of nursing studies. 2015;52(12):1824-33.
94. Pooley JA, Cohen L. Resilience: A definition in context. Australian Community Psychologist. 2010;22(1):30-7.
95. Aburn G, Gott M, Hoare K. What is resilience? An integrative review of the empirical literature. Journal of advanced nursing. 2016;72(5):980-1000.

96. Herrman H, Stewart DE, Diaz-Granados N, Berger EL, Jackson B, Yuen T. What is Resilience? The Canadian Journal of Psychiatry. 2011;56(5):258-65.
97. Hart PL, Brannan JD, De Chesnay M. Resilience in nurses: an integrative review. Journal of Nursing Management. 2014;22(6):720-34.
98. Coutu DL. How resilience works. Harvard business review. 2002;80(5):46-56.
99. Windle G, Bennett KM, Noyes J. A methodological review of resilience measurement scales. Health and Quality of Life Outcomes. 2011;9(1):8.
100. Friborg O, Hjemdal O, Rosenvinge JH, Martinussen M. A new rating scale for adult resilience: what are the central protective resources behind healthy adjustment? International journal of methods in psychiatric research. 2003;12(2):65-76.
101. Smith BW, Dalen J, Wiggins K, Tooley E, Christopher P, Bernard J. The brief resilience scale: assessing the ability to bounce back. International journal of behavioral medicine. 2008;15(3):194-200.
102. Coronavirus.data.gov.uk 2021 [Available from: https://coronavirus.data.gov.uk/details/healthcare.
103. Ali S, Maguire S, Marks E, Doyle M, Sheehy C. Psychological impact of the COVID-19 pandemic on healthcare workers at acute hospital settings in the South-East of Ireland: an observational cohort multicentre study. BMJ Open. 2020;10(12):e042930.
104. Azoulay E, Cariou A, Bruneel F, Demoule A, Kouatchet A, Reuter D, et al. Symptoms of anxiety, depression, and peritraumatic dissociation in critical care clinicians managing patients with COVID-19. A cross-sectional study. American journal of respiratory and critical care medicine. 2020;202(10):1388-98.
105. Cabarkapa S, Nadjidai SE, Murgier J, Ng CH. The psychological impact of COVID-19 and other viral epidemics on frontline healthcare workers and ways to address it: A rapid systematic review. Brain Behav Immun Health. 2020;8:100144-.
106. Carmassi C, Foghi C, Dell'Oste V, Cordone A, Bertelloni CA, Bui E, et al. PTSD symptoms in healthcare workers facing the three coronavirus outbreaks: What can we expect after the COVID-19 pandemic. Psychiatry research. 2020:113312.
107. Farnsworth JK, Drescher KD, Nieuwsma JA, Walser RB, Currier JM. The role of moral emotions in military trauma: Implications for the study and treatment of moral injury. Review of General Psychology. 2014;18(4):249-62.
108. Litz BT, Stein N, Delaney E, Lebowitz L, Nash WP, Silva C, et al. Moral injury and moral repair in war veterans: A preliminary model and intervention strategy. Clinical psychology review. 2009;29(8):695-706.
109. Williamson V, Murphy D, Greenberg N. COVID-19 and experiences of moral injury in front-line key workers. Occupational Medicine. 2020;70(5):317-9.
110. Currier JM, Holland JM, Drescher K, Foy D. Initial psychometric evaluation of the Moral Injury Questionnaire—Military version. Clinical psychology & psychotherapy. 2015;22(1):54-63.
111. Shale S. Moral injury and the COVID-19 pandemic: reframing what it is, who it affects and how care leaders can manage it. BMJ Leader. 2020:leader-2020-000295.
112. Čartolovni A, Stolt M, Scott PA, Suhonen R. Moral injury in healthcare professionals: A scoping review and discussion. Nursing Ethics.0969733020966776.
113. Rodziewicz TL, Houseman B, Hipskind JE. Medical Error Reduction and Prevention. StatPearls [Internet]: StatPearls Publishing; 2021.
114. Mascioli S, Carrico CB. Spotlight on the 2016 national patient safety goals for hospitals. Nursing2020 Critical Care. 2016;11(6):19-22.

115. Donaldson MS, Corrigan JM, Kohn LT. To err is human: building a safer health system. 2000.
116. Stelfox HT, Palmisani S, Scurlock C, Orav EJ, Bates DW. The “To Err is Human” report and the patient safety literature. BMJ Quality & Safety. 2006;15(3):174-8.
117. Elliott R, Camacho E, Campbell F, Jankovic D, St James MM, Kaltenthaler E, et al. Prevalence and economic burden of medication errors in the NHS in England. Rapid evidence synthesis and economic analysis of the prevalence and burden of medication error in the UK. 2018.
118. Sutherland A, Canobbio M, Clarke J, Randall M, Skelland T, Weston E. Incidence and prevalence of intravenous medication errors in the UK: a systematic review. European Journal of Hospital Pharmacy. 2020;27(1):3-8.
119. Elliott RA, Camacho E, Jankovic D, Sculpher MJ, Faria R. Economic analysis of the prevalence and clinical and economic burden of medication error in England. BMJ Qual Saf. 2021;30(2):96-105.
120. Sexton J, Helmreich R, Neilands T, Rowan K, Vella K, Boyden J, et al. The Safety Attitudes Questionnaire: Psychometric Properties, Benchmarking Data, and Emerging Research. BMC health services research. 2006;6:44.
121. Thomas EJ, Sexton JB, Neilands TB, Frankel A, Helmreich RL. The effect of executive walk rounds on nurse safety climate attitudes: a randomized trial of clinical units. BMC health services research. 2005;5(1):1-9.
122. Helmreich R, Merritt A, Sherman P, Gregorich S, Wiener E. The flight management attitudes questionnaire (FMAQ). Austin, TX: University of Texas NASA/UT/FAA. 1993;9394.
123. Sexton JB, Makary MA, Tersigni AR, Pryor D, Hendrich A, Thomas EJ, et al. Teamwork in the operating roomfrontline perspectives among hospitals and operating room personnel. Anesthesiology: The Journal of the American Society of Anesthesiologists. 2006;105(5):877-84.
124. Gabrani A, Hoxha A, Simaku A, Gabrani JC. Application of the Safety Attitudes Questionnaire (SAQ) in Albanian hospitals: a cross-sectional study. BMJ open. 2015;5(4):e006528.
125. Relihan E, Glynn S, Daly D, Silke B, Ryder S. Measuring and benchmarking safety culture: application of the safety attitudes questionnaire to an acute medical admissions unit. Irish journal of medical science. 2009;178(4):433-9.
126. Pinheiro JPA, de Sousa Uva A. Safety climate in the operating room: Translation, validation and application of the Safety Attitudes Questionnaire. Revista Portuguesa de Saúde Pública. 2016;34(2):107-16.
127. Dictionaries O. Personality: Definition of reasoning in English by Oxford Dictionaries [online]. Accessed 4th December 2018.
128. Bergner RM. What is personality? Two myths and a definition. New Ideas in Psychology. 2020;57:100759.
129. Boyle GJ, Matthews G, Saklofske DH. The SAGE handbook of personality theory and assessment: personality theories and models (Volume 1): Sage; 2008.
130. Smith BD, Vetter HJ. Theories of personality: Prentice-Hall, Inc; 1991.
131. Fleeson W, Jayawickreme E. Whole trait theory. Journal of research in personality. 2015;56:82-92.
132. Eysenck HJ, Eysenck S. The Eysenck personality inventory. British Journal of Educational Studies. 1965;14(1).

133. Cattell RB, Eber HW, Tatsuoka MM. Handbook for the sixteen personality factor questionnaire (16 PF): In clinical, educational, industrial, and research psychology, for use with all forms of the test: Institute for Personality and Ability Testing; 1970.
134. Cattell RB. The description of personality: Principles and findings in a factor analysis. The American journal of psychology. 1945;58(1):69-90.
135. McLeod S. Type A personality. Simply Psychology. 2017.
136. Fiske DW. Consistency of the factorial structures of personality ratings from different sources. The Journal of Abnormal and Social Psychology. 1949;44(3):329.
137. Saville P, Cattell RB, Eber HW, Tatsuoka MM. The British Standardisation of the 16PF Supplement of Norms, Forms A and B: NFER Publishing Company Limited; 1972.
138. 16pf.com. [Available from: https://www.16pf.com/wp-content/uploads/Resources-Appreciating-Unusual-Responses-in-16pf-Results-White-Paper.pdf.
139. McCrae RR, Costa Jr PT. The stability of personality: Observations and evaluations. Current directions in psychological science. 1994;3(6):173-5.
140. Roberts BW, DelVecchio WF. The rank-order consistency of personality traits from childhood to old age: a quantitative review of longitudinal studies. Psychological bulletin. 2000;126(1):3.
141. Pervin LA. A critical analysis of current trait theory. Psychological Inquiry. 1994;5(2):103-13.
142. Kogan N. Personality and aging. Handbook of the psychology of aging. 1990;3:330-46.
143. Specht J, Luhmann M, Geiser C. On the consistency of personality types across adulthood: Latent profile analyses in two large-scale panel studies. Journal of personality and social psychology. 2014;107(3):540.
144. Dyrbye LN, Massie FS, Eacker A, Harper W, Power D, Durning SJ, et al. Relationship between burnout and professional conduct and attitudes among US medical students. Jama. 2010;304(11):1173-80.
145. Dyrbye LN, Thomas MR, Massie FS, Power DV, Eacker A, Harper W, et al. Burnout and suicidal ideation among US medical students. Annals of internal medicine. 2008;149(5):334-41.
146. Tabachnick B, Fidell L. Using multivariate analysis. Boston: llyn & Bacon. Pearson Education; 2001.
147. Remann P, Nordin A. Personality tests in recruitment. 2021.
148. Mokaya SM. Effect of Personality Tests on Recruitment: United States International University-Africa; 2012.
149. Zhang L, Liu B, Ren H, Liu Y-F, Zhang Y. The personality profile of excellent nurses in China: The 16PF. Contemporary nurse. 2013;43(2):219-24.
150. Kluger M, Watson D, Laidlaw T, Fletcher T. Personality testing and profiling for anaesthetic job recruitment: attitudes of anaesthetic specialists/consultants in New Zealand and Scotland. Anaesthesia. 2002;57(2):116-22.
151. Ayuso-Murillo D, Colomer-Sanchez A, Herrera-Peco I. Communication skills in ICU and adult hospitalisation unit nursing staff. Enfermería Intensiva (English ed). 2017;28(3):105-13.
152. Haight SJ, Chibnall JT, Schindler DL, Slavin SJ. Associations of medical student personality and health/wellness characteristics with their medical school performance across the curriculum. Academic Medicine. 2012;87(4):476-85.
153. Doherty EM, Nugent E. Personality factors and medical training: a review of the literature. Medical education. 2011;45(2):132-40.

154. Meit SS, Cubic BA, Borges NJ, Yasek V. Assessing medical students' personalities: A parallel comparison of normed and perception-based metrics. Psychological reports. 2005;96(3_suppl):1029-43.
155. Peng R, Khaw H, Edariah A. Personality and performance of preclinical medical students. Medical education. 1995;29(4):283-8.
156. Kluger M, Laidlaw T, Khursandi D. Personality profiles of Australian anaesthetists. Anaesthesia and intensive care. 1999;27(3):282-6.
157. Xu M, Qin X, Dust SB, DiRenzo MS. Supervisor-subordinate proactive personality congruence and psychological safety: A signaling theory approach to employee voice behavior. The Leadership Quarterly. 2019;30(4):440-53.
158. Seyda B, Tabancali E. Correlations between teachers' personality, psychological safety perception and teacher voice. Eurasian Journal of Educational Research. 2020;20(85):185-204.
159. Parks L, Guay RP. Personality, values, and motivation. Personality and individual differences. 2009;47(7):675-84.
160. Patterson F, Prescott-Clements L, Zibarras L, Edwards H, Kerrin M, Cousans F. Recruiting for values in healthcare: a preliminary review of the evidence. Advances in Health Sciences Education. 2016;21(4):859-81.
161. Bar MA, Leurer MK, Warshawski S, Itzhaki M. The role of personal resilience and personality traits of healthcare students on their attitudes towards interprofessional collaboration. Nurse education today. 2018;61:36-42.
162. Terry L. Understanding and applying personality types in healthcare communication. Nursing Standard (Royal College of Nursing (Great Britain): 1987). 2020.
163. Horwood J, Maw A. Theatre teams assembled using personality profiles can improve predicted teamworking scores. The Bulletin of the Royal College of Surgeons of England. 2012;94(3):1-6.
164. Meit S, Meit H, Yasek V. Personality traits of incoming WVU medical students: phase I gender findings. The West Virginia Medical Journal. 1999;95(3):123-6.
165. Park YS, Konge L, Artino AR. The positivism paradigm of research. Academic Medicine. 2020;95(5):690-4.
166. Westbrook L. Qualitative research methods: A review of major stages, data analysis techniques, and quality controls. Library & information science research. 1994;16(3):241-54.
167. Miles BW, Jozefowicz-Simbeni DMH. Naturalistic inquiry. The handbook of social work research methods. 2010:415-24.
168. Tashakkori A, Johnson RB, Teddlie C. Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences: Sage publications; 2020.
169. Hall R. Mixed methods: In search of a paradigm. Conducting research in a changing and challenging world. 2013:71-8.
170. Creswell JW, Clark VLP. Designing and conducting mixed methods research: Sage publications; 2017.
171. Morse JM. Principles of mixed methods and multimethod research design. Handbook of mixed methods in social and behavioral research. 2003;1:189-208.
172. Tariq S, Woodman J. Using mixed methods in health research. JRSM Short Rep. 2013;4(6):2042533313479197-.
173. Harding G, Gantley M. Qualitative methods: beyond the cookbook. Fam Pract. 1998;15(1):76-9.

174. Halcomb EJ, Hickman L. Mixed methods research. 2015.
175. Zhang W, Creswell J. The use of “mixing” procedure of mixed methods in health services research. Medical care. 2013;51(8):e51-e7.
176. Ritchie J, Lewis J, Nicholls CM, Ormston R. Qualitative research practice: A guide for social science students and researchers: sage; 2013.
177. Words WW. Way With Words | Audio To Text Services & Solutions [Available from: https://waywithwords.net.
178. Knox S, Burkard AW. Qualitative research interviews. Psychotherapy research. 2009;19(4-5):566-75.
179. Crabtree BF, DiCicco-Bloom B. The qualitative research interview. Medical Education. 2006;40(4):314-8.
180. Hill CE, Thompson BJ, Williams EN. A guide to conducting consensual qualitative research. The counseling psychologist. 1997;25(4):517-72.
181. Gaskell G. Individual and group interviewing. Qualitative researching with text, image and sound. 2000:38-56.
182. Braun V, Clarke V. Using thematic analysis in psychology. Qualitative research in psychology. 2006;3(2):77-101.
183. Landis JR, Koch GG. The measurement of observer agreement for categorical data. biometrics. 1977:159-74.
184. Burla L, Knierim B, Barth J, Liewald K, Duetz M, Abel T. From text to codings: intercoder reliability assessment in qualitative content analysis. Nursing research. 2008;57(2):113-7.
185. Help-nv11.qsrinternational.com. NVivo 11 for Windows Help - Run a coding comparison query [Available from: http://help-nv11.qsrinternational.com/desktop/procedures/run_a_coding_comparison_query.htm.
186. Dodgson JE. Reflexivity in qualitative research. Journal of Human Lactation. 2019;35(2):220-2.
187. Berger R. Now I see it, now I don’t: Researcher’s position and reflexivity in qualitative research. Qualitative research. 2015;15(2):219-34.
188. Haynes K. Reflexivity in qualitative research. Qualitative organizational research: Core methods and current challenges. 2012:72-89.
189. Carifio J, Perla R. Resolving the 50-year debate around using and misusing Likert scales. Medical education. 2008;42(12):1150-2.
190. Norman G. Likert scales, levels of measurement and the “laws” of statistics. Advances in health sciences education. 2010;15(5):625-32.
191. Joshi A, Kale S, Chandel S, Pal DK. Likert scale: Explored and explained. British Journal of Applied Science & Technology. 2015;7(4):396.
192. Boone HN, Boone DA. Analyzing likert data. Journal of extension. 2012;50(2):1-5.
193. Clarke I, Morin J, Warnell I. Personality factors and the practice of anaesthesia: a psychometric evaluation. Canadian journal of anaesthesia. 1994;41(5):393.
194. Eley D, Eley R, Bertello M, Rogers-Clark C. Why did I become a nurse? Personality traits and reasons for entering nursing. J Adv Nurs. 2012;68(7):1546-55.
195. 2021]. POHoAahwpce-gAD. PSI Online 2020 [Available from: Available at: <https://www.psionline.com/en-gb/>.
196. Russell MT, Cattell RB, Cattell A, Cattell HE, Karol DL. 16PF fifth edition administrator's manual: Institute for Personality and Ability Testing, Incorporated; 1994.
197. Reuter EK, Wallbrown FH, Barnett RW. Comparing 16 PF scores for two groups of offenders. Psychological reports. 1989;64(1):287-90.

198. Williamson JM, Lounsbury JW. Distinctive 16 PF personality traits of librarians. Journal of library administration. 2016;56(2):124-43.
199. Wakcher S, Cross K, Blackman MC. Personality comparison of airline pilot incumbents, applicants, and the general population norms on the 16PF. Psychological Reports. 2003;92(3):773-80.
200. Combs JP, Onwuegbuzie AJ. Describing and illustrating data analysis in mixed research. 2010.
201. Palinkas LA, Horwitz SM, Green CA, Wisdom JP, Duan N, Hoagwood K. Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. Administration and policy in mental health and mental health services research. 2015;42(5):533-44.
202. Ando H, Cousins R, Young C. Achieving saturation in thematic analysis: Development and refinement of a codebook. Comprehensive Psychology. 2014;3:03. CP. 3.4.
203. Lowe A, Norris AC, Farris AJ, Babbage DR. Quantifying thematic saturation in qualitative data analysis. Field Methods. 2018;30(3):191-207.
204. Saunders B, Sim J, Kingstone T, Baker S, Waterfield J, Bartlam B, et al. Saturation in qualitative research: exploring its conceptualization and operationalization. Quality & quantity. 2018;52(4):1893-907.
205. Corbin J, Strauss A. Basics of qualitative research: Techniques and procedures for developing grounded theory: Sage publications; 2014.
206. Mason M, editor Sample size and saturation in PhD studies using qualitative interviews. Forum qualitative Sozialforschung/Forum: qualitative social research; 2010.
207. Donaldson LJ. Safe high quality health care: investing in tomorrow's leaders. Quality in Health Care. 2001;10(suppl 2):ii8-ii12.
208. Cooperberg MR, Birkmeyer JD, Litwin MS. Defining high quality health care. Urol Oncol. 2009;27(4):411-6.
209. O'Donovan R, McAuliffe E. A systematic review exploring the content and outcomes of interventions to improve psychological safety, speaking up and voice behaviour. BMC Health Services Research. 2020;20(1):101.
210. Glenton C BM, Downe S, Paulsen EJ, Lewin S, on behalf of Effective Practice and Organisation of Care (EPOC). EPOC Qualitative Evidence Synthesis: Protocol and review template. EPOC Resources for review authors. Oslo: Norwegian Institute of Public Health [Internet]. 2019. Available from: http://epoc.cochrane.org/epoc-specific-resources-review-authors.
211. Moher D, Liberati A, Tetzlaff J, Altman DG, Group P. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. PLoS med. 2009;6(7):e1000097.
212. Lewin S, Bohren M, Rashidian A, Munthe-Kaas H, Glenton C, Colvin CJ, et al. Applying GRADE-CERQual to qualitative evidence synthesis findings—paper 2: how to make an overall CERQual assessment of confidence and create a Summary of Qualitative Findings table. Implementation Science. 2018;13(1):10.
213. Munthe-Kaas H, Bohren MA, Glenton C, Lewin S, Noyes J, Tunçalp Ö, et al. Applying GRADE-CERQual to qualitative evidence synthesis findings—paper 3: how to assess methodological limitations. Implementation Science. 2018;13(1):9.
214. Colvin CJ, Garside R, Wainwright M, Munthe-Kaas H, Glenton C, Bohren MA, et al. Applying GRADE-CERQual to qualitative evidence synthesis findings—paper 4: how to assess coherence. Implementation Science. 2018;13(1):13.

215. Glenton C, Carlsen B, Lewin S, Munthe-Kaas H, Colvin CJ, Tunçalp Ö, et al. Applying GRADE-CERQual to qualitative evidence synthesis findings—paper 5: how to assess adequacy of data. Implementation Science. 2018;13(1):14.
216. Cooke A, Smith D, Booth A. Beyond PICO: the SPIDER tool for qualitative evidence synthesis. Qualitative health research. 2012;22(10):1435-43.
217. Critical Appraisal Skills Programme, CASP Qualitative Checklist [online] 2018 [Available from: www.casp-uk.net.
218. Management CfEB. Critical Appraisal of a Survey 2020 [Available from: https://www.cebma.org/wp-content/uploads/Critical-Appraisal-Questions-for-a-Survey.pdf.
219. KELLEY K, CLARK B, BROWN V, SITZIA J. Good practice in the conduct and reporting of survey research. International Journal for Quality in Health Care. 2003;15(3):261-6.
220. Taylor N, Clay-Williams R, Hogden E, Braithwaite J, Groene O. High performing hospitals: a qualitative systematic review of associated factors and practical strategies for improvement. BMC Health Services Research. 2015;15(1):244.
221. Krippendorff K. Content analysis: An introduction to its methodology: Sage publications; 2018.
222. Abdi Z, Delgoshaei B, Ravaghi H, Abbasi M, Heyrani A. The culture of patient safety in an Iranian intensive care unit. Journal of nursing management. 2015;23(3):333-45.
223. Alilu L, Zamanzadeh V, Fooladi MM, Valizadeh L, Habibzadeh H. Towards an understanding of clinical nurses challenges that leads intention to leave. Acta Paulista De Enfermagem. 2016;29(5):534-41.
224. Alingh CW, van Wijngaarden JD, van de Voorde K, Paauwe J, Huijsman R. Speaking up about patient safety concerns: the influence of safety management approaches and climate on nurses' willingness to speak up. BMJ quality & safety. 2019;28(1):39-48.
225. Attree M. Factors influencing nurses' decisions to raise concerns about care quality. Journal of nursing management. 2007;15(4):392-402.
226. Aveling E-L, Kayonga Y, Nega A, Dixon-Woods M. Why is patient safety so hard in low-income countries? A qualitative study of healthcare workers' views in two African hospitals. Globalization and health. 2015;11(1):6.
227. Baik D, Zierler B. Clinical nurses' experiences and perceptions after the implementation of an interprofessional team intervention: A qualitative study. Journal of clinical nursing. 2019;28(3-4):430-43.
228. Belyansky I, Martin TR, Prabhu AS, Tsirline VB, Howley LD, Phillips R, et al. Poor resident-attending intraoperative communication may compromise patient safety. Journal of Surgical Research. 2011;171(2):386-94.
229. Churchman JJ, Doherty C. Nurses' views on challenging doctors' practice in an acute hospital. Nursing Standard (through 2013). 2010;24(40):42.
230. Edrees HH, Ismail MNM, Kelly B, Goeschel CA, Berenholtz SM, Pronovost PJ, et al. Examining influences on speaking up among critical care healthcare providers in the United Arab Emirates. International Journal for Quality in Health Care. 2017;29(7):948-60.
231. Etchegaray JM, Thomas EJ. Engaging employees: the importance of high-performance work systems for patient safety. Journal of patient safety. 2015;11(4):221-7.
232. Farag A, Lose D, Gedney-Lose A. Nurses' Safety Motivation: Examining Predictors of Nurses' Willingness to Report Medication Errors. Western journal of nursing research. 2019;41(7):954-72.
233. Garon M. Speaking up, being heard: registered nurses' perceptions of workplace communication. Journal of Nursing Management. 2012;20(3):361-71.

234. Garon M. The positive face of resistance: nurses relate their stories. JONA: The Journal of Nursing Administration. 2006;36(5):249-58.
235. Gauld R, Horsburgh S. Healthcare professional perspectives on quality and safety in New Zealand public hospitals: findings from a national survey. Aust Health Rev. 2014;38(1):109-14.
236. Gausvik C, Lautar A, Miller L, Pallerla H, Schlaudecker J. Structured nursing communication on interdisciplinary acute care teams improves perceptions of safety, efficiency, understanding of care plan and teamwork as well as job satisfaction. Journal of multidisciplinary healthcare. 2015;8:33.
237. Hemingway MW, O'Malley C, Silvestri S. Safety culture and care: a program to prevent surgical errors. AORN journal. 2015;101(4):404-15.
238. Hirak R, Peng AC, Carmeli A, Schaubroeck JM. Linking leader inclusiveness to work unit performance: The importance of psychological safety and learning from failures. The Leadership Quarterly. 2012;23(1):107-17.
239. Hughes KM, Benenson RS, Krichten AE, Clancy KD, Ryan JP, Hammond C. A crew resource management program tailored to trauma resuscitation improves team behavior and communication. Journal of the American College of Surgeons. 2014;219(3):545-51.
240. Jayasuriya-Illesinghe V, Guruge S, Gamage B, Espin S. Interprofessional work in operating rooms: a qualitative study from Sri Lanka. BMC surgery. 2016;16(1):61.
241. Kaafarani HM, Itani KM, Rosen AK, Zhao S, Hartmann CW, Gaba DM. How does patient safety culture in the operating room and post-anesthesia care unit compare to the rest of the hospital? The American Journal of Surgery. 2009;198(1):70-5.
242. Kolbe M, Burtscher MJ, Wacker J, Grande B, Nohynkova R, Manser T, et al. Speaking up is related to better team performance in simulated anesthesia inductions: an observational study. Anesthesia & Analgesia. 2012;115(5):1099-108.
243. Law BYS, Chan EA. The experience of learning to speak up: a narrative inquiry on newly graduated registered nurses. Journal of clinical nursing. 2015;24(13-14):1837-48.
244. Livorsi D, Knobloch M, Blue L, Swafford K, Maze L, Riggins K, et al. A rapid assessment of barriers and facilitators to safety culture in an intensive care unit. International nursing review. 2016;63(3):372-6.
245. Lockett JJ, Barkley L, Stichler J, Palomo J, Kik B, Walker C, et al. Defining peer-to-peer accountability from the nurse's perspective. JONA: The Journal of Nursing Administration. 2015;45(11):557-62.
246. Lyndon A, Sexton JB, Simpson KR, Rosenstein A, Lee KA, Wachter RM. Predictors of likelihood of speaking up about safety concerns in labour and delivery. BMJ Publishing Group Ltd; 2012.
247. Malloy DC, Hadjistavropoulos T, McCarthy EF, Evans RJ, Zakus DH, Park I, et al. Culture and organizational climate: nurses' insights into their relationship with physicians. Nursing Ethics. 2009;16(6):719-33.
248. Martinez W, Lehmann LS, Thomas EJ, Etchegaray JM, Shelburne JT, Hickson GB, et al. Speaking up about traditional and professionalism-related patient safety threats: a national survey of interns and residents. BMJ quality & safety. 2017;26(11):869-80.
249. Maxfield DG, Lyndon A, Kennedy HP, O'Keeffe DF, Zlatnik MG. Confronting safety gaps across labor and delivery teams. American journal of obstetrics and gynecology. 2013;209(5):402-8. e3.
250. McLinton SS, Dollard MF, Tuckey MMR. New perspectives on psychosocial safety climate in healthcare: A mixed methods approach. Safety Science. 2018;109:236-45.

251. Ortega A, Sánchez-Manzanares M, Gil F, Rico R. Enhancing team learning in nursing teams through beliefs about interpersonal context. Journal of Advanced Nursing. 2013;69(1):102-11.
252. Pian-Smith MC, Simon R, Minehart RD, Podraza M, Rudolph J, Walzer T, et al. Teaching residents the two-challenge rule: a simulation-based approach to improve education and patient safety. Simulation in Healthcare. 2009;4(2):84-91.
253. Piers RD, Versluys KJJ, Devoghel J, Lambrecht S, Vyt A, Van Den Noortgate NJ. A Typology of Interprofessional Teamwork in Acute Geriatric Care: A Study in 55 units in Belgium. Journal of the American Geriatrics Society. 2017;65(9):2064-70.
254. Putnam LR, Levy SM, Kellagher CM, Etchegaray JM, Thomas EJ, Kao LS, et al. Surgical resident education in patient safety: where can we improve? journal of surgical research. 2015;199(2):308-13.
255. Raemer DB, Kolbe M, Minehart RD, Rudolph JW, Pian-Smith M. Improving anesthesiologists' ability to speak up in the operating room: a randomized controlled experiment of a simulation-based intervention and a qualitative analysis of hurdles and enablers. Academic Medicine. 2016;91(4):530-9.
256. Rathert C, Ishqaidef G, May DR. Improving work environments in health care: Test of a theoretical framework. Health care management review. 2009;34(4):334-43.
257. Richard A, Pfeiffer Y, Schwappach D. Development and Psychometric Evaluation of the Speaking Up About Patient Safety Questionnaire. Journal of patient safety. 2017.
258. Roberts KE, Bonafide CP, Paine CW, Paciotti B, Tibbetts KM, Keren R, et al. Barriers to calling for urgent assistance despite a comprehensive pediatric rapid response system. American Journal of Critical Care. 2014;23(3):223-9.
259. Roussin CJ, Larraz E, Jamieson K, Maestre JM. Psychological Safety, Self-Efficacy, and Speaking Up in Interprofessional Health Care Simulation. Clinical Simulation in Nursing. 2018;17:38-46.
260. Rutherford J, Flin R, Mitchell L. Teamwork, communication, and anaesthetic assistance in Scotland. British journal of anaesthesia. 2012;109(1):21-6.
261. Sayre MM, McNeese-Smith D, Phillips LR, Leach LS. A strategy to improve nurses speaking up and collaborating for patient safety. JONA: The Journal of Nursing Administration. 2012;42(10):458-60.
262. Schwappach DL, Gehring K. Silence that can be dangerous: a vignette study to assess healthcare professionals' likelihood of speaking up about safety concerns. PLoS One. 2014;9(8).
263. Schwappach DL, Gehring K. Trade-offs between voice and silence: a qualitative exploration of oncology staff's decisions to speak up about safety concerns. BMC health services research. 2014;14(1):303.
264. Schwappach D, Richard A. Speak up-related climate and its association with healthcare workers' speaking up and withholding voice behaviours: a cross-sectional survey in Switzerland. Bmj Quality & Safety. 2018;27(10):827-35.
265. Schwappach D, Sendlhofer G. Speaking up about patient safety in perioperative care: differences between academic and Nonacademic Hospitals in Austria and Switzerland. Journal of Investigative Surgery. 2018:1-9.
266. Schwappach DL. Speaking up about hand hygiene failures: A vignette survey study among healthcare professionals. American journal of infection control. 2018;46(8):870-5.

267. Schwappach D, Sendlhofer G, Häsler L, Gombotz V, Leitgeb K, Hoffmann M, et al. Speaking up behaviors and safety climate in an Austrian university hospital. International journal for quality in health care. 2018;30(9):701-7.
268. Sundqvist AS, Carlsson AA. Holding the patient's life in my hands: S wedish registered nurse anaesthetists' perspective of advocacy. Scandinavian journal of caring sciences. 2014;28(2):281-8.
269. Sur MD, Schindler N, Singh P, Angelos P, Langerman A. Young surgeons on speaking up: when and how surgical trainees voice concerns about supervisors' clinical decisions. The American Journal of Surgery. 2016;211(2):437-44.
270. Szymczak JE. Infections and interaction rituals in the organisation: clinician accounts of speaking up or remaining silent in the face of threats to patient safety. Sociology of health & illness. 2016;38(2):325-39.
271. Tamuz M, Giardina TD, Thomas EJ, Menon S, Singh H. Rethinking resident supervision to improve safety: from hierarchical to interprofessional models. Journal of hospital medicine. 2011;6(8):445-52.
272. Tangirala S, Ramanujam R. Exploring nonlinearity in employee voice: The effects of personal control and organizational identification. Academy of Management Journal. 2008;51(6):1189-203.
273. Tarrant C, Leslie M, Bion J, Dixon-Woods M. A qualitative study of speaking out about patient safety concerns in intensive care units. Social Science & Medicine. 2017;193:8-15.
274. Todorova IL, Alexandrova-Karamanova A, Panayotova Y, Dimitrova E. Organizational hierarchies in B ulgarian hospitals and perceptions of justice. British journal of health psychology. 2014;19(1):204-18.
275. Urisman T, Garcia A, Harris HW. Impact of surgical intensive care unit interdisciplinary rounds on interprofessional collaboration and quality of care: Mixed qualitative-quantitative study. Intensive and Critical Care Nursing. 2018;44:18-23.
276. Van Bogaert P, Peremans L, de Wit M, Franck E, Timmermans O, Havens DS. Nurse managers' perceptions and experiences regarding staff nurse empowerment: a qualitative study. Frontiers in psychology. 2015;6:1585.
277. Weiss M, Kolbe M, Grote G, Dambach M, Marty A, Spahn DR, et al. Agency and communion predict speaking up in acute care teams. Small Group Research. 2014;45(3):290-313.
278. Weller JM, Barrow M, Gasquoine S. Interprofessional collaboration among junior doctors and nurses in the hospital setting. Medical education. 2011;45(5):478-87.
279. Whitehair L, Hurley J, Provost S. Envisioning successful teamwork: An exploratory qualitative study of team processes used by nursing teams in a paediatric hospital unit. Journal of Clinical Nursing. 2018;27(23-24):4257-69.
280. Bate P. Context is Everything. London: Health Foundation 2014.
281. Rainer J. Speaking up: factors and issues in nurses advocating for patients when patients are in jeopardy. Journal of nursing care quality. 2015;30(1):53-62.
282. Hunt DF, Bailey J, Lennox BR, Crofts M, Vincent C. Enhancing psychological safety in mental health services. International Journal of Mental Health Systems. 2021;15(1):33.
283. Kerns CD. Situational context: A core leadership dimension. Journal of Leadership, Accountability and Ethics. 2015;12(1):11.
284. Hu X, Casey T. How and when organization identification promotes safety voice among healthcare professionals. Journal of Advanced Nursing. 2021;77(9):3733-44.

285. O'Donovan R, Van Dun D, McAuliffe E. Measuring psychological safety in healthcare teams: developing an observational measure to complement survey methods. BMC Medical Research Methodology. 2020;20(1):203.
286. O'Donovan R, De Brún A, McAuliffe E. Healthcare Professionals Experience of Psychological Safety, Voice, and Silence. Frontiers in Psychology. 2021;12:383.
287. Simpson AV, Farr-Wharton BSR, Reddy P, editors. Correlating workplace compassion, psychological safety and bullying in the healthcare context. Academy of Management Proceedings; 2019: Academy of Management Briarcliff Manor, NY 10510.
288. Rangachari P, L. Woods J. Preserving Organizational Resilience, Patient Safety, and Staff Retention during COVID-19 Requires a Holistic Consideration of the Psychological Safety of Healthcare Workers. International Journal of Environmental Research and Public Health. 2020;17(12):4267.
289. Ma Y, Faraz NA, Ahmed F, Iqbal MK, Saeed U, Mughal MF, et al. Curbing nurses' burnout during COVID-19: The roles of servant leadership and psychological safety. Journal of Nursing Management. 2021.
290. Okuyama A, Wagner C, Bijnen B. Speaking up for patient safety by hospital-based health care professionals: a literature review. BMC Health Services Research. 2014;14(1):61.
291. Corr M. Reducing occupational stress in intensive care. Nursing in critical care. 2000;5(2):76-81.
292. Grailey K, Bryden D, Brett S. The Faculty of Intensive Care Medicine Workforce Survey–What impacts on our working lives? Journal of the Intensive Care Society. 2019;20(2):111-7.
293. Grailey K, Leon-Villapalos C, Murray E, Brett S. Exploring the factors that promote or diminish a psychologically safe environment: a qualitative interview study with critical care staff. BMJ open. 2021;11(8):e046699.
294. BANDWIDTH | Meaning & Definition for UK English | Lexico.com [Available from: https://www.lexico.com/definition/bandwidth.
295. O'Donovan R, McAuliffe E. Exploring psychological safety in healthcare teams to inform the development of interventions: combining observational, survey and interview data. BMC health services research. 2020;20(1):1-16.
296. Pearsall MJ, Ellis AP. Thick as thieves: the effects of ethical orientation and psychological safety on unethical team behavior. Journal of Applied Psychology. 2011;96(2):401.
297. Welzel T. Patient safety: Minimising medical error. Continuing Medical Education. 2012;30(11):406-9.
298. Green B, Tsiroyannis C, Brennan P. Human factors–recognising and minimising errors in our day to day practice. Oral diseases. 2016;22(1):19-22.
299. Wu AW. Medical error: the second victim: the doctor who makes the mistake needs help too. British Medical Journal Publishing Group; 2000. p. 726-7.
300. Gallagher TH. Supporting health care workers after medical error: considerations for health care leaders. JCOM. 2008;15(5):240-7.
301. Hall LH, Johnson J, Watt I, Tsipa A, O'Connor DB. Healthcare staff wellbeing, burnout, and patient safety: a systematic review. PloS one. 2016;11(7):e0159015.
302. Salam A, Segal DM, Abu-Helalah MA, Gutierrez ML, Joosub I, Ahmed W, et al. The impact of work-related stress on medication errors in Eastern Region Saudi Arabia. International Journal for Quality in Health Care. 2019;31(1):30-5.

303. Chandrasekar K. Workplace environment and its impact on organisational performance in public sector organisations. International journal of enterprise computing and business systems. 2011;1(1):1-19.
304. Giddings B, Thomas J, Little L. Evaluation of the Workplace Environment in the UK, and the Impact on Users' Levels of Stimulation. Indoor and Built Environment. 2013;22(6):965-76.
305. Zadeh RS, Shepley MM, Owora AH, Dannenbaum MC, Waggener LT, Chung SSE. The importance of specific workplace environment characteristics for maximum health and performance: healthcare workers' perspective. Journal of Occupational and Environmental Medicine. 2018;60(5):e245-e52.
306. Trousselard M, Dutheil F, Naughton G, Cosserant S, Amadon S, Dualé C, et al. Stress among nurses working in emergency, anesthesiology and intensive care units depends on qualification: a Job Demand-Control survey. International archives of occupational and environmental health. 2016;89(2):221-9.
307. Koinis A, Giannou V, Drantaki V, Angelaina S, Stratou E, Saridi M. The Impact of Healthcare Workers Job Environment on Their Mental-emotional Health. Coping Strategies: The Case of a Local General Hospital. Health Psychol Res. 2015;3(1):1984-.
308. Laschinger HKS, Finegan J, Shamian J, Almost J. Testing Karasek's demands-control model in restructured healthcare settings: effects of job strain on staff nurses' quality of work life. JONA: The Journal of Nursing Administration. 2001;31(5):233-43.
309. Sibbald B, Shen J, McBride A. Changing the skill-mix of the health care workforce. Journal of health services research & policy. 2004;9(1_suppl):28-38.
310. Firth-Cozens J. Organisational trust: the keystone to patient safety. BMJ Quality & Safety. 2004;13(1):56-61.
311. Kalra J, Kalra N, Baniak N. Medical error, disclosure and patient safety: A global view of quality care. Clinical biochemistry. 2013;46(13-14):1161-9.
312. Milligan FJ. Establishing a culture for patient safety–The role of education. Nurse education today. 2007;27(2):95-102.
313. England NHE. Health Careers Accessed 8th May 2019 [Available from: https://www.healthcareers.nhs.uk/explore-roles/nursing/roles-nursing/adult-nurse/personal-characteristics-and-skills-required-adult-nursing.
314. Boyacı K, Şensoy F, Beydağ KD, Kıyak M. Stress and stress management in health institutions. Procedia-Social and Behavioral Sciences. 2014;152:470-5.
315. Chou L-P, Li C-Y, Hu SC. Job stress and burnout in hospital employees: comparisons of different medical professions in a regional hospital in Taiwan. BMJ Open. 2014;4(2):e004185.
316. Halpin Y, Terry LM, Curzio J. A longitudinal, mixed methods investigation of newly qualified nurses' workplace stressors and stress experiences during transition. Journal of advanced nursing. 2017;73(11):2577-86.
317. Tyler P, Cushway D. Stress and wellbeing in healthcare staff: The role of negative affectivity, and perceptions of job demand and discretion. Stress Medicine. 1998;14(2):99-107.
318. Angioha PU, Omang TA, Ishie EU, Iji ME. Employee Stressors and Wellbeing of Healthcare Workers in Government owned Hospitals in Calabar, Nigeria. Journal of Public Administration. 2020;2(4):2020.
319. Liu Y, Lu L, Wang W-X, Liu S, Chen H-R, Gao X, et al. Job burnout and occupational stressors among chinese healthcare professionals at county-level health alliances. International journal of environmental research and public health. 2020;17(6):1848.

320. Greenslade JH, Wallis M, Johnston AN, Carlström E, Wilhelms DB, Crilly J. Key occupational stressors in the ED: an international comparison. Emergency Medicine Journal. 2020;37(2):106-11.
321. Pereira DS, Araújo TSSL, Gois CFL, GOIS JÚNIOR JP, Rodriguez EOL, SANTOS Vd. Occupational stressors among nurses working in urgent and emergency care units. Revista gaucha de enfermagem. 2014;35:55-61.
322. Karimi A, Adel-Mehraban M, Moeini M. Occupational stressors in nurses and nursing adverse events. Iranian Journal of Nursing and Midwifery Research. 2018;23(3):230.
323. Ito S, Fujita S, Seto K, Kitazawa T, Matsumoto K, Hasegawa T. Occupational stress among healthcare workers in Japan. Work. 2014;49(2):225-34.
324. Golubic R, Milosevic M, Knezevic B, Mustajbegovic J. Work-related stress, education and work ability among hospital nurses. Journal of advanced nursing. 2009;65(10):2056-66.
325. Soheili M, Taleghani F, Jokar F, Eghbali-Babadi M, Sharifi M. Occupational stressors in oncology nurses: A qualitative descriptive study. Journal of Clinical Nursing. 2021.
326. Guest G, Namey E, Chen M. A simple method to assess and report thematic saturation in qualitative research. PLoS One. 2020;15(5):e0232076.
327. Conn SR, Rieke ML. The 16PF fifth edition technical manual: Inst for Personality &; 1994.
328. Meit SS, Borges NJ, Early LA. Personality profiles of incoming male and female medical students: results of a multi-site 9-year study. Medical Education Online. 2007;12(1):4462.
329. Charani E, Ahmad R, Rawson T, Castro-Sanchèz E, Tarrant C, Holmes A. The differences in antibiotic decision-making between acute surgical and acute medical teams: an ethnographic study of culture and team dynamics. Clinical Infectious Diseases. 2019;69(1):12-20.
330. Dodoo JE, Surienty L, Zahidah S. Safety citizenship behaviour of miners in Ghana: The effect of hardiness personality disposition and psychological safety. Safety science. 2021;143:105404.
331. Beus JM, Muñoz GJ, Arthur Jr W. Personality as a multilevel predictor of climate: An examination in the domain of workplace safety. Group & Organization Management. 2015;40(5):625-56.
332. Kuo C-C, Ye Y-C, Chen M-Y, Chen LH. Proactive personality enhances change in employees' job satisfaction: The moderating role of psychological safety. Australian Journal of Management. 2019;44(3):482-94.
333. Psionline.com. Comprehensive Insights Report: PSI [Available from: https://www.psionline.com/wp-content/uploads/16pf_6th-Edition_Comprehensive-Insights-Report_Ella_SAMPLE.pdf.
334. Grailey K, Lound A, Brett S. Lived experiences of healthcare workers on the front line during the COVID-19 pandemic: a qualitative interview study. BMJ Open. 2021;11(12):e053680.
335. Horowitz M, Wilner N, Alvarez W. Impact of Event Scale: A measure of subjective stress. Psychosomatic medicine. 1979;41(3):209-18.
336. Lovibond PF, Lovibond SH. The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. Behaviour research and therapy. 1995;33(3):335-43.
337. Tam CW, Pang EP, Lam LC, Chiu HF. Severe acute respiratory syndrome (SARS) in Hong Kong in 2003: stress and psychological impact among frontline healthcare workers. Psychological medicine. 2004;34(7):1197.

338. Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, et al. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. JAMA network open. 2020;3(3):e203976-e.
339. Kang L, Ma S, Chen M, Yang J, Wang Y, Li R, et al. Impact on mental health and perceptions of psychological care among medical and nursing staff in Wuhan during the 2019 novel coronavirus disease outbreak: A cross-sectional study. Brain, behavior, and immunity. 2020;87:11-7.
340. Giusti EM, Pedroli E, D'Aniello GE, Badiale CS, Pietrabissa G, Manna C, et al. The psychological impact of the COVID-19 outbreak on health professionals: a cross-sectional study. Frontiers in Psychology. 2020;11.
341. Balakumar C, Rait J, Montauban P, Zarsadias P, Iqbal S, Fernandes R. COVID-19: are frontline surgical staff ready for this? Journal of British Surgery. 2020;107(7):e195-e.
342. Muller RAE, Stensland RSØ, van de Velde RS. The mental health impact of the covid-19 pandemic on healthcare workers, and interventions to help them: A rapid systematic review. Psychiatry research. 2020:113441.
343. Pappa S, Ntella V, Giannakas T, Giannakoulis VG, Papoutsi E, Katsaounou P. Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis. Brain, behavior, and immunity. 2020.
344. Si M-Y, Su X-Y, Jiang Y, Wang W-J, Gu X-F, Ma L, et al. Psychological impact of COVID-19 on medical care workers in China. Infectious diseases of poverty. 2020;9(1):1-13.
345. Lasalvia A, Bonetto C, Porru S, Carta A, Tardivo S, Bovo C, et al. Psychological impact of COVID-19 pandemic on healthcare workers in a highly burdened area of north-east Italy. Epidemiology and psychiatric sciences. 2021;30.
346. Conti C, Fontanesi L, Lanzara R, Rosa I, Porcelli P. Fragile heroes. The psychological impact of the COVID-19 pandemic on health-care workers in Italy. PloS one. 2020;15(11):e0242538.
347. Khee KS, Lee LB, Chai OT, Loong CK, Ming CW, Kheng TH. The psychological impact of SARS on health care providers. Critical Care and Shock. 2004:100-6.
348. Mehta S, Machado F, Kwizera A, Papazian L, Moss M, Azoulay É, et al. COVID-19: a heavy toll on health-care workers. The Lancet Respiratory Medicine. 2021;9(3):226-8.
349. Kumar D, Tahir Saghir GA, Yasin U, Furnaz S, Karim M, Hussain M, et al. Psychosocial Impact of COVID-19 on Healthcare Workers at a Tertiary Care Cardiac Center of Karachi Pakistan. Journal of Occupational and Environmental Medicine. 2021;63(2):e59.
350. Feingold JH, Peccoralo L, Chan CC, Kaplan CA, Kaye-Kauderer H, Charney D, et al. Psychological Impact of the COVID-19 Pandemic on Frontline Health Care Workers During the Pandemic Surge in New York City. Chronic Stress. 2021;5:2470547020977891.
351. Walton M, Murray E, Christian MD. Mental health care for medical staff and affiliated healthcare workers during the COVID-19 pandemic. European Heart Journal: Acute Cardiovascular Care. 2020;9(3):241-7.
352. Ridner SH. Psychological distress: concept analysis. Journal of advanced nursing. 2004;45(5):536-45.
353. Shih F-J, Gau M-L, Kao C-C, Yang C-Y, Lin Y-S, Liao Y-C, et al. Dying and caring on the edge: Taiwan's surviving nurses' reflections on taking care of patients with severe acute respiratory syndrome. Applied Nursing Research. 2007;20(4):171-80.
354. Sun N, Wei L, Shi S, Jiao D, Song R, Ma L, et al. A qualitative study on the psychological experience of caregivers of COVID-19 patients. American journal of infection control. 2020;48(6):592-8.

355. Yin X, Zeng L. A study on the psychological needs of nurses caring for patients with coronavirus disease 2019 from the perspective of the existence, relatedness, and growth theory. International Journal of Nursing Sciences. 2020;7(2):157-60.
356. Schulte EE, Bernstein CA, Cabana MD. Addressing faculty emotional responses during the coronavirus 2019 pandemic. The Journal of pediatrics. 2020;222:13-4.
357. Greenberg N, Docherty M, Gnanapragasam S, Wessely S. Managing mental health challenges faced by healthcare workers during covid-19 pandemic. bmj. 2020;368.
358. Pillay R. Managerial competencies of hospital managers in South Africa: a survey of managers in the public and private sectors. Human Resources for Health. 2008;6(1):4.
359. Mosadeghrad A, Jaafaripooyan E, abbasi m. Evaluation of hospital managers' performance in Sari. Hospital. 2018;17(1):29-44.
360. Mohammad Mosadegh Rad A, Hossein Yarmohammadian M. A study of relationship between managers' leadership style and employees' job satisfaction. Leadership in Health Services. 2006;19(2):11-28.
361. Adriaenssens J, Hamelink A, Van Bogaert P. Predictors of occupational stress and well-being in First-Line Nurse Managers: A cross-sectional survey study. International journal of nursing studies. 2017;73:85-92.
362. Hewko SJ, Brown P, Fraser KD, Wong CA, Cummings GG. Factors influencing nurse managers' intent to stay or leave: a quantitative analysis. Journal of nursing management. 2015;23(8):1058-66.
363. Johansson G, Sandahl C, Hasson D. Role stress among first-line nurse managers and registered nurses–a comparative study. Journal of Nursing Management. 2013;21(3):449-58.
364. Jackson D, Daly J. Improving the workplace: The pivotal role of nurse leaders. Taylor & Francis; 2010.
365. Caplan RP. Stress, anxiety, and depression in hospital consultants, general practitioners, and senior health service managers. BMJ. 1994;309(6964):1261.
366. Jamal M, Baba VV. Job Stress and Burnout Among Canadian Managers and Nurses: An Empirical Examination. Canadian Journal of Public Health. 2000;91(6):454-8.
367. Kaissi A. Manager-physician relationships: an organizational theory perspective. The health care manager. 2005;24(2):165-76.
368. Davies HT, Harrison S. Trends in doctor-manager relationships. Bmj. 2003;326(7390):646-9.
369. Forbes T, Hallier J, Kelly L. Doctors as managers: investors and reluctants in a dual role. Health Services Management Research. 2004;17(3):167-76.
370. Davies HT, Hodges C-L, Rundall TG. Views of doctors and managers on the doctor-manager relationship in the NHS. Bmj. 2003;326(7390):626-8.
371. Klopper-Kes A, Meerdink N, van Harten WH, Wilderom CP. Stereotypical images between physicians and managers in hospitals. Journal of health organization and management. 2009.
372. Mallak LA. Measuring resilience in health care provider organizations. Health manpower management. 1998.
373. Imperial.nhs.uk. Who we are [Available from: https://www.imperial.nhs.uk/about-us/who-we-are.
374. Trust ICNH. How we are Organised 2020 [Available from: https://www.imperial.nhs.uk/about-us/who-we-are/how-we-are-organised
.

375. Smith BW, Epstein EM, Ortiz JA, Christopher PJ, Tooley EM. The foundations of resilience: what are the critical resources for bouncing back from stress? Resilience in children, adolescents, and adults: Springer; 2013. p. 167-87.
376. Association BM. The mental health and wellbeing of the medical workforce - now and beyond COVID-19 2020 [Available from: https://www.bma.org.uk/media/2475/bma-covid-19-and-nhs-staff-mental-health-wellbeing-report-may-2020.pdf.
377. Edmondson AC, Kramer RM, Cook KS. Psychological safety, trust, and learning in organizations: A group-level lens. Trust and distrust in organizations: Dilemmas and approaches. 2004;12:239-72.
378. Zhang Y, Wan MM. The double-edged sword effect of psychological safety climate: a theoretical framework. Team Performance Management: An International Journal. 2021.
379. Chang SW, Lee KS, Ham SS, Lee SA, Hahn TK, Sohn YW, editors. The effects of mutual inclusiveness between captains and first officers on psychological safety and engagement in flight safety. Proceedings of the Human Factors and Ergonomics Society Annual Meeting; 2008: SAGE Publications Sage CA: Los Angeles, CA.
380. Jang S-W, Lee K-S, Kim Y-K, Sohn Y-W. The Effects of Inclusiveness between Team Members on Psychological Safety and Improvement Efforts in a Commercial Airline Cockpit. Journal of the Korean Society for Aviation and Aeronautics. 2009;17(2):41-51.
381. NHS. Stress - Every Mind Matters [Available from: https://www.nhs.uk/every-mind-matters/mental-health-issues/stress/.
382. Ervasti M, Kallio J, Määttänen I, Mäntyjärvi J, Jokela M. Influence of personality and differences in stress processing among Finnish students on interest to use a mobile stress management app: survey study. JMIR mental health. 2019;6(5):e10039.
383. Connor-Smith JK, Flachsbart C. Relations between personality and coping: a meta-analysis. Journal of personality and social psychology. 2007;93(6):1080.
384. Seligman ME. Building resilience. Harvard business review. 2011;89(4):100-6.
385. Oliver KG, Collin P, Burns J, Nicholas J. Building resilience in young people through meaningful participation. Australian e-Journal for the advancement of Mental Health. 2006;5(1):34-40.
386. Le Cornu R. Building resilience in pre-service teachers. Teaching and Teacher Education. 2009;25(5):717-23.

APPENDICES

Appendix 1. Topic Guide for Qualitative Interview – Attitudes to Safety

Study Title: Attitudes Towards Safety Within the Critical Care Environment and the Presence of Psychological Safety: A Qualitative Interview and Questionnaire Study.
IRAS Reference: 254169

Topic Guide: Qualitative Interview

Research goals of the interviews

- What is the structure of the critical care environment and does this affect perceptions of safety?
- How psychologically safe do individuals feel within their workplace?
- What are the impacts and consequences of a lack of psychological safety?
- What are the individual's experiences of teamwork and hierarchies?

(a) Introduction, overview of interview structure (Approximately 10 minutes)

- Welcome, introduction of researcher and the project
- Background and Instructions regarding the interview:

"We are interested in your experiences of teamwork and being able to speak up when errors occur within the critical care environment. We will begin by asking a few structured questions, first regarding the structure of your workplace and then some questions regarding how you feel about teamwork and working relationships within your critical care unit. From then we will discuss your own experiences and you can tell us about times when you have felt both empowered to speak up within your team or intimidated."

- Provide participant information sheet to read through. Provide opportunity for questions arising from this.
- Sign Consent form
- Explain re: audio recording
- **"Feel free to ask any questions at any stage during the interview"**
- **"I may make notes so that we can return to a topic later in the interview"**

- Ask the participant questions to identify and elicit details regarding the demographics of their workplace:
  - Current role and level of responsibility
  - Presence of side rooms vs open bays
  - Frequency of short staffing: elaborate on multidisciplinary team.
  - General information regarding staffing / short staffing levels
  - Patient demographics
  - Presence of senior staff
- **Ask the participant about how they feel the team-working is within their critical care unit.**

(b) Exploration of psychological safety (approximately 20 minutes)

- Psychological Safety. You will be read out a series of statements which correspond to how you may feel whilst working in the critical care environment. Please state how strongly you agree with these statement (agree, ambivalent, disagree) and then please feel free to elaborate on how that statement is relevant to you.

    i. **"If you make a mistake on this team, it is often held against you"**
    ii. **"Members of this team are able to bring up problems and tough issues"**
    iii. **"People on this team sometimes reject others for being different"**
    iv. **"It is safe to take a risk on this team"**
    v. **"It is difficult to ask other members of this team for help"**
    vi. **"No one on this team would deliberately act in a way that undermines my efforts"**
    vii. **"Working with members of this team, my unique skills and talents are valued and utilised"**

(c) *Discussion regarding safety (Approximately 30 mins)*

I would now like to move on to a slightly different topic, teamwork and safety of the critical care environment.

- Enquire about attitudes to teamwork within the critical care environment
    i. **Tell me about some examples of teamwork that you have experienced?**
        1. Can go on to ask about examples of poor vs good teamwork
        2. Explore differences between these and what differentiates them
    ii. **Explore ideas around team working**
        1. What qualities make it easier to work within a team within the critical care environment?
        2. What makes a good team or a bad team? (*If not addressed in previous question)*
        3. Do you think it is beneficial that all team members can speak up?
        4. Explore attitudes to hierarchy within teams. Does the participant think hierarchy is a useful construct?
    iii. **What coping mechanisms do you have when teamwork is poor?**
        1. When do you need to use these mechanisms?
        2. Have you learnt these or were they inherent?
- Identify and elicit details on safety within the workplace
    i. **What makes you feel unsafe at work?**
        1. Previous examples of this?
    ii. **What makes you feel that the service you are delivering is unsafe?**
    iii. **Do you feel able to speak up if you notice errors being made?**
        1. Explore differences between if it is the participants own error or another member of the team
        2. Explore the role of managers in dealing with error

3. Attitudes to learning within the team and learning from error

(d) Conclusion (approximately 5 minutes)

- Sum up what has been discussed, mention positive aspects, thank the participant
- Is there anything important regarding your experiences of safety and teamwork within the critical care environment that we haven't discussed?
- If you want to follow any issues you have talked about, you can contact us (provide information)
- Inform the participant that if they wish to withdraw from the study, their data will not be used.
- Provide copy of the Safety Attitudes Questionnaire for completion by the participant at the end of the interview.

Safety Attitudes: Frontline Perspectives from this Patient Care Area

I work in the (clinical area or patient care area where you typically spend your time): _____ **This is in the Department of:** _____ **Please complete this survey with respect to your experiences in this clinical area.**

- **Use number 2 pencil only.** (USE A NO. 2 PENCIL ONLY)
- **Erase cleanly any mark you wish to change.**

Correct Mark ● **Incorrect Marks** ✓ ⊗ ◒ ◔

Please answer the following items with respect to your specific unit or clinical area. Choose your responses using the scale below:

A	B	C	D	E	X
Disagree Strongly	Disagree Slightly	Neutral	Agree Slightly	Agree Strongly	Not Applicable

	A Disagree Strongly	B Disagree Slightly	C Neutral	D Agree Slightly	E Agree Strongly	X Not Applicable
1. Nurse input is well received in this clinical area.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
2. In this clinical area, it is difficult to speak up if I perceive a problem with patient care.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
3. Disagreements in this clinical area are resolved appropriately (i.e., not *who* is right, but *what* is best for the patient).	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
4. I have the support I need from other personnel to care for patients.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
5. It is easy for personnel here to ask questions when there is something that they do not understand.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
6. The physicians and nurses here work together as a well-coordinated team.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
7. I would feel safe being treated here as a patient.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
8. Medical errors are handled appropriately in this clinical area.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
9. I know the proper channels to direct questions regarding patient safety in this clinical area.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
10. I receive appropriate feedback about my performance.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
11. In this clinical area, it is difficult to discuss errors.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
12. I am encouraged by my colleagues to report any patient safety concerns I may have.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
13. The culture in this clinical area makes it easy to learn from the errors of others.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
14. My suggestions about safety would be acted upon if I expressed them to management.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
15. I like my job.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
16. Working here is like being part of a large family.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
17. This is a good place to work.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
18. I am proud to work in this clinical area.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
19. Morale in this clinical area is high.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
20. When my workload becomes excessive, my performance is impaired.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
21. I am less effective at work when fatigued.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
22. I am more likely to make errors in tense or hostile situations.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
23. Fatigue impairs my performance during emergency situations (e.g. emergency resuscitation, seizure).	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
24. Management supports my daily efforts: Unit Mgt	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
Hosp Mgt	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
25. Management doesn't knowingly compromise pt safety: Unit Mgt	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
Hosp Mgt	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
26. Management is doing a good job: Unit Mgt	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
Hosp Mgt	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
27. Problem personnel are dealt with constructively by our: Unit Mgt	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
Hosp Mgt	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
28. I get adequate, timely info about events that might affect my work, from: Unit Mgt	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
Hosp Mgt	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
29. The levels of staffing in this clinical area are sufficient to handle the number of patients.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
30. This hospital does a good job of training new personnel.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
31. All the necessary information for diagnostic and therapeutic decisions is routinely available to me.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
32. Trainees in my discipline are adequately supervised.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
33. I experience good collaboration with nurses in this clinical area.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
34. I experience good collaboration with staff physicians in this clinical area.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
35. I experience good collaboration with pharmacists in this clinical area.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ
36. Communication breakdowns that lead to delays in delivery of care are common.	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓧ

BACKGROUND INFORMATION

Have you completed this survey before? ○ Yes ○ No ○ Don't Know **Today's Date (month/year):**_____

Position: (mark only one)

- ○ Attending/Staff Physician
- ○ Fellow Physician
- ○ Resident Physician
- ○ Physician Assistant/Nurse Practitioner
- ○ Nurse Manager/Charge Nurse
- ○ Registered Nurse
- ○ Pharmacist
- ○ Therapist (RT, PT, OT, Speech)
- ○ Clinical Social Worker
- ○ Dietician/Nutritionist
- ○ Clinical Support (CMA, EMT, Nurses Aide, etc.)
- ○ Technologist/Technician (e.g., Surg., Lab, Rad.)
- ○ Admin Support (Clerk/Secretary/Receptionist)
- ○ Environmental Support (Housekeeper)
- ○ Other Manager (e.g., Clinic Manager)
- ○ Other:_____

Mark your gender: ○ Male ○ Female **Primarily** ○ Adult ○ Peds ○ Both

Years in specialty: ○ Less than 6 months ○ 6 to 11 mo. ○ 1 to 2 yrs ○ 3 to 4 yrs ○ 5 to 10 yrs ○ 11 to 20 yrs ○ 21 or more

Thank you for completing the survey - your time and participation are greatly appreciated.

PLEASE DO NOT WRITE IN THIS AREA

Copyright © 2004 by The University of Texas at Austin

Mark Reflex® forms by Pearson NCS MW263511-1 321 HC99 Printed in U.S.A.

Appendix 3. Qualitative data supporting themes and subthemes that demonstrate the influence of situational context on psychological safety at different levels within the workplace.

Theme: Contextual Factors Influencing Psychological Safety		
Level	Subtheme	Supporting Quotations (with job role and interview code)
Individual	*Location to speak up*	"others *[junior nurses]* are probably quite intimidated by having a consultant and five doctors and three nurses and everyone there" *Junior Doctor 0032* "it is very hard if you're standing there, because the consultants are rarely on their own saying something like that, usually they have a team of regs or SHOs or maybe another consultant or another team there, and you're not usually just challenging that one decision, it's usually been a collective decision maybe by that stage" *Staff Nurse 0010*
	Personality	"But some, I think it's personality, have that respect barrier that they *[senior doctors]* can't get over, although I'm not putting it there" *Senior Nurse 0011* "I think it's a personality thing. I do think that you can… I don't think there's any reason why you can't speak up and say." *Junior Doctor 0006* "The approachability of me as a manager. And some people say I am approachable and some people say I'm not. Because I've had to take that away and look at my personality" *Senior Nurse 0011* "It's just my personality. I will only talk if it is really necessary. But I'm also a good team player. But most of the time, I have my personality that I will just keep quiet." *Senior Staff Nurse 0012* "I think it probably stems from our background personalities and acknowledge that a lot of the decisions that we make, that I make personally, are wrong. So, I want to make sure that there are people around me that can a, tell me I'm wrong, or b, come up with a better suggestion" *Senior Doctor 0021*
	Previous Experiences of speaking up	"I guess for a few days, I felt less inclined to volunteer my ideas as to why a patient had a thing, but I got over it. I think a degree of thick skin is necessary because you do have stupid ideas" *Junior Doctor 0018* "I think if you've had your hand bitten off before when you've tried to say something then you're a bit less likely to do it again" *Senior Physiotherapist 0020*
	Culture	"It's a cultural thing. Definitely not a personality, definitely a culture." *Senior Nurse 0011* "And they'll *[nursing staff]* be like, but I can't say that, Doctor." *Senior Doctor 0024* "sometimes it's difficult for people to change the culture they have been in or brought up from to do that" *Senior Nurse 0009*
	Confidence in ability	"I think it's hard for them because they're *[junior physiotherapist]* obviously very under-experienced and they would question then going to speak to an ITU nurse who's been there for ten years especially sometimes they get a bit nervous speaking to the medical team." *Senior Physiotherapist 0015* "You're quite mindful of some of the conversations that you're having because you don't want to show that you're vulnerable and maybe that you're not capable of doing the job" *Senior Staff Nurse 0022* "they *[junior staff members]* probably lack confidence in their own knowledge and skill, which then makes it more scary to speak to someone who they perceive as having a lot more knowledge and skill" *Physiotherapist 0020* "So when I first started, obviously, it's because you're so nervous and then you think if I do say that then I can't cope then I think they *[senior staff members]* will think bad of me." *Senior Nurse 0016* "I think it's difficult if you're trying to escalate something and you don't really know yourself how you've rationalised it or made that decision" *Senior Staff Nurse 0022*
Team	*Roles within team / Clarity regarding role within team*	"That maybe with the nurse there's an issue and they may tend to ignore it. In part, because maybe people don't want to disrupt team working. I think everybody realises it's important and there's a concern that if they raise it, it may disrupt that" *Senior Doctor 0013*

	Leadership	"Are they *[senior doctors]* going to challenge you and embarrass you in front of everyone on ward round if you speak up or say something wrong?" *Staff Nurse 0010* "I'm aware that medicine is hierarchical so I try to actively encourage people to speak up" *Senior Doctor 0013* "I encourage them *[junior staff members]* to call by my first name to try and make it as a team. They still know I'm the boss as it were but call me by my first name so therefore they feel they can approach me but they won't and no matter how many times I ask them" *Senior Doctor 0013* "Not all of the consultants are as open to everyone else. And again I don't think that that person would shout you down, for example. I think they don't really ask your opinion and they wouldn't really listen to it if you gave it to them" *Senior Physiotherapist 0020* "I think some consultants, I wouldn't even be comfortable raising it at all because you just think I know you're not going to be interested in this" *Junior Doctor 0027* "That is how I love to do things. It's teamwork. Everyone should speak up. Everyone should speak up. Everyone should say what they think. I have been criticised by my juniors before. And I thought it was a great thing. I always want to hear what they think, and I always want them to speak up" *Senior Doctor 0029* "When I'm talking about a difficult decision, then I actively seek alternative views or the views of those present" *Senior Doctor 0024* "does, what do you think, or I don't know what to do, what do you think? He's *[senior doctor]* very good at that and he really makes you feel like you're part of the team" *Junior Doctor 0025*
	Personality	"even if you are the experienced one, if you meet someone who has a difficult personality, you will think twice before speaking up. Because they may get offended or defensive or personal. So, I think personality plays a big role there" *Senior Doctor 0029*
Organisational	*Hierarchy*	"if something bigger comes up, I don't know how the management will react". *Junior Staff Nurse 0014* "I think that still a lot of people are operating an old school theory or perspective that they *[senior doctors]* don't want to listen to what the junior bedside nurses saying" *Senior Staff Nurse 0022* "Hopefully we've created an environment where even the most junior nurse quickly realises that this is very much an open forum. And some of the things I say at the end of every visit to the bed space is, are you happy with the plan? Is there anything else you'd like us to see to? Summarise what we've all said" *Senior Doctor 0021* "There are consultants who don't want you to go straight to them, which is understandable because you have to go through the proper channel" *Staff Nurse 0012* "I think the junior doctors would be less anxious to speak up to the consultant. The nurses would find it harder" *Senior Doctor 0028* "with the medical staff, it is very much, I am the consultant. You have been here six months. You will do as I say. Even though that nurse might have some information which they have been there 12 hours. I think sometimes it is a, sort of, barrier. Not to explain to them why they have made that decision" *Senior Staff Nurse 0031* "I think nurses will have a higher threshold to speak up if it is against a consultant's decision" *Senior Doctor 0029*
	Alternative routes for voicing concerns	"I feel like we were given multiple opportunities to speak up because if you didn't want to in the ward round, then you could perfectly, easily later in the day or the second ward round or the reg ward round or you could speak to a nurse. There were multiple avenues for raising a concern as long as it's not an emergency". *Junior Doctor 0018* "but there isn't a forum to bring up difficult… It depends what a difficult issue is. There's not really the forum to discuss any interpersonal issues we have with each other in the wider MDT" *Physiotherapist 0017* "you would try and voice it to your nurse in charge and then if they can try and voice it to the consultant" *Staff Nurse 0010*

		"If you want to talk to somebody, you talk to anybody that you feel comfortable talking to. And that issue or problem will get through to where it needs to" *Staff Nurse 0010* "I say why don't we go speak to them *[senior staff members]* together and then you can try and learn from that way as well? But often they would probably come to their senior rather than another member of the MDT in the first instance I would say" *Senior Physiotherapist 0015* "If is a difficult consultant I will ask my nurse in charge first, what do you think about this? We'll go together to the consultant." *Junior Staff Nurse 0033* "I think even if a nurse that's more junior doesn't feel they can speak up, if they then go and tell one of the matrons they will come and say to us, look, actually someone's concerned about this." *Senior Doctor 0026*
	Organisational Culture	"It is safe but I think the culture has been not to. So you have to be fairly strong willed to actually come up and say it." *Senior Staff Nurse 0009* "There is the risk of speaking up having a negative impact on your career and on your assessments. There is also a culture of not questioning people with authority, I think, clearly, in medicine." *Senior Doctor 0028* "from a nursing perspective nurses have always been more reticent in coming forward and saying things" *Senior Staff Nurse 0009* "probably people will think it really doesn't matter whether we say it out loud or not or whether we bring it up or not or we tend to help each other out and it's like, oh, it's fine it's just like this." *Senior Staff Nurse 0016*
	Organisational Support	"They escalated it all the way through silver to gold and I said, what did they *[management]* say? And they said, they're aware." *Senior Doctor 0026* "I disagree because I think it's when you ask a bit too much. I don't know. I feel that they're okay, but if something bigger comes up, I don't know how the management will react" *Junior Staff Nurse 0014* "I felt very stressed because I didn't know if I would be backed by my managers that I was doing the right thing" *Senior Staff Nurse 0022*

Appendix 4. Qualitative data supporting the themes and subthemes within the negative consequences of psychological safety framework.

THEME	SUB-THEMES	SUPPORTING DATA
Impact on Bandwidth	Fatigue	*""But if they're telling you every little problem, as a junior it's weird because at nights you can have someone come to you every ten minutes and tell you about something, and you have to then make a decision as to whether that is actually a problem or not." Junior Doctor 0005* *"You've got to be able to ignore or be able to filter the fluff, the nonsense, of which there's masses." Junior Doctor 0018* *"I don't think they [nursing staff] really understand that you're sifting thousands of bits of data and trying to make decisions and looking for patterns. And if you keep getting interrupted then actually you can miss those things and that's a safety risk because I think they just don't really understand what we do" Senior Doctor 0026*
	Distraction	*"You're being continually distracted. It happens all day" Senior Doctor 0026* *"And if you keep getting interrupted then actually you can miss those things and that's a safety risk because I think they [nursing staff] just don't really understand what we do" Senior Doctor 0026* *"There's a definite risk. When you're a consultant, I think ultimately when you're in those ward rounds and you've got one consultant leading the ward round, and you've got dieticians, physios, pharmacists, everyone going on it, if everyone's buying in, there's only so much bandwidth that those consultants can have to confuse all their information" Senior Staff Nurse 0009* *"they [nursing staff] used to be much better at saving for an appropriate time. Whereas now, you can be trying to have a conversation or, indeed, a middle of a ward round and you'll be asked to prescribe" Senior Doctor 0024*
	Workload	*"makes a four hour ward round take two hours longer which then makes everyone else really busy in the evening because none of the jobs are done" Junior Doctor 0032* *"Especially our junior staff to maybe reign it in a little bit. Is that really pertinent, should you have spoken to the deputy first about that or asked your senior colleague next to you rather than harass the doctors. Because they've got everything else to do as well" Senior Staff Nurse 0009* *But you then spend 15 minutes for every patient talking about their physio plan which makes a four hour ward round take two hours longer which then makes everyone else really busy in the evening because none of the jobs are done" Junior Doctor 0032* *"you have to have set boundaries" Senior Doctor 0023*
Context	Emergency vs Elective	*"It might not be a good idea in a really stressed situation when everyone's running around trying to do the best they can for a patient and obviously, if somebody senior knows exactly what's happening and it's something that you need to deal with incredibly quickly. For example, some sort of airway emergency then you wouldn't be questioning, why does the patient need intubation?" Junior Doctor 0019* *"It depends what they're [junior staff] saying and when. If they want to nag about trivial crap in the middle of a conversation about something much more important, then no, it's not appropriate. There's a time and a place." Senior Doctor 0024*

	Presence of hierarchy	*"But sometimes more experienced people in the team should have the freedom to mute all this information coming from the speaker." Senior Doctor 0029* *Yes, definitely. If I am dealing… If I am leading a ward round with ten people and everyone is speaking up, that of course is stressful. But that is extreme. It doesn't happen every day. Senior Doctor 0029*
Motivation	Undermining colleagues	*"nursing staff can go to more than one doctor over a period of time, and so you can do one thing and another doctor will do another thing, and I think that's the difficulty in such an environment" Junior Doctor 0005* *"You see that in junior doctors that come through or members of the team that may not want to take responsibility, but they just want to be critical" Senior Doctor 0021* *"Like some junior staff will come to me because I'm the manager so they think that's my job to do something. Whereas I have to then send them back and say actually, you need to go to your line manager who's the band seven. It's not me"* *Senior Staff Nurse 0011*
	Demonstrate own ability	*"But you get members of the team constantly, instead of saying yes, this is a difficult situation, what are we doing here? That question. What are we exactly doing here? That's not helpful. So that that can be frustrating." Senior Doctor 0021* *"There's a definite risk. When you're a consultant, I think ultimately when you're in those ward rounds and you've got one consultant leading the ward round, and you've got dieticians, physios, pharmacists, everyone going on it, if everyone's buying in, there's only so much bandwidth that those consultants can have to confuse all their information" Junior Doctor 0027* *"to be honest but there are certain cases I can think of where you think, well, that's in no way valuable". Junior Doctor 0027*

Appendix 5. Qualitative data supporting the Safety Attitudes thematic framework

THEME	SUB-THEME	SUPPORTING QUALITATIVE DATA
The presence of a safe environment	Staffing	*"Sometimes I feel like it was unsafe. Most of the time because we have not enough staff, so you have in a lot of places, thinking about many things, and yes, mistakes can happen." Staff Nurse, 0033* *'I've never I thought to myself, this is all falling, something terrible is going to happen but I certainly can think of times where I think, this is feels really stretched, we're on the edge here, just one more emergency, and I think we're going to be in trouble." Junior Doctor, 0027* *"Because you don't have staff and then that's kind of out of your control. You can't do anything." Senior Nurse, 0016* *"In terms of safety, staffing is one of the things that makes me nervous and makes me stressed." Consultant, 0026* *"But there are certainly times when I think back where I think you're being pulled in four or five different directions and you just think, I can't put these fires out quick enough" Junior Doctor, 0027*
	Inevitability of errors occurring	*"I was terrified of that, that day. I can't even explain how bad it was. That was kind of an impending error" Staff Nurse, 0007* *"it's not helping at least the situation because if you work under stress, at some point, you will make a mistake, I think" Staff Nurse, 0014* *"I have some acceptance that mistakes will happen. But I don't think here that there is… That there isn't… I think there is a way of avoiding all the time here. Or minimising mistakes." Consultant, 0029* *"But yes, I have often felt that the service is unsafe and that there is nothing I can do about it." Consultant, 0024* *"the only thing may be lack of nursing staff, although they do try and are doing what they do do, I feel like there's a potential, particularly overnight, for there to be more problems" Junior Doctor, 0005* *"We should always hope that we should not commit an error but it always happens." Staff Nurse, 0012*
	Working beyond comfort zone	*"And problems will happen, because the amount of work that we are dealing with is a bit overwhelming" Consultant, 0029* *"felt like I was doing things beyond my knowledge base but that is in part how I learn" Junior Doctor, 0018* *"I was doing roles that I shouldn't have been doing" Staff Nurse 0010* *"working more than you can cope sometime. So, it is very stressful. Maybe it's more of a stress because of overload" Senior Nurse, 0016* *"you're always watching out and things can go wrong really quickly in here." Staff Nurse, 0010* *"Even when you understand that's in a way out of the nurse in charge hands, it doesn't make it any better because then you know that neither the medical management or the corporate management don't view it the same was as you do" Staff Nurse, 0009* *"the support from further up the medical team isn't as good. Then that is just a big stress ball of the whole shift and potential for mistakes and errors or conflicts to arise is greatly increased. So it does depend" Staff Nurse, 0009* *"I feel like if I ever needed help, I could get it. "Junior Doctor 0018*

		"you are by your own and sometimes it is stressful." Staff Nurse, 0033
Error Reporting	Presence of an 'open' reporting culture	*"I think we've got a very good, very positive culture around reporting errors" Senior Nurse, 0022* *"But I don't think you'd fear the consequences because everyone on the team was so supportive and they would have helped you to deal with it" Junior Doctor, 0019* *"we wanted to foster a positive culture around it, where people weren't afraid to complete these incident forms, because we don't see it as a culture of blame, we see it as what is the problem, what were the circumstances around that problem" "I think the problem with having an open policy on Datexs is the ones that really need discussing don't get discussed as much as they should be." Consultant, 0023* *"It's difficult because there's a lot of staff and there's a lot of low harm… I mean, there's an enormous amount of low harm Datix. The majority of those are low harm" Consultant, 0026* *"there is that openness as well to report it, and that if there was anything we did feel was unsafe" Staff Nurse, 0010*
	Futility	*"We're expected to do better, but I think that means there's a lot of coverup by certain people, where I think people aren't honest, and a I think a reflection of our statistics and our audits is fake," Staff Nurse, 0010* *"I don't really feel like it's necessarily a learning experience" Senior Physiotherapist 0020* *"there's no system in place, I think, really, to learn. Because let's face it, it will be a costly system." Consultant, 0021* *"bigger, more important things that they need to deal with and we just have to live with it and carry on." Consultant, 0021* *"So like the Datex system, when you put in your millions of questions, if anything, almost puts you off doing it because of the length of form" Senior Physiotherapist, 0020* *"Yes, because to report about this, you spend time. You have to write a lot of things and go through a long form, but I think it's good to report it, even if they are not taking any action because it's in there, so if you want to complain, you want to go for further complaints, you have the act that you have reported. But I've never seen an action after a Datix" Staff Nurse, 0033* *"Because nothing is changed. I mean I think is good to report things but if nothing is changed, why I have to spend my time?" Staff Nurse, 0033* *"They respond you like no action is being taken." Staff Nurse, 0033* *"But that's a really... like, the feedback takes so long to come through that it's... I'd forgotten I'd even done it by the time I hear back which is not very helpful." Staff Nurse, 0030*
	Opportunities to learn from error	*"You won't Datix it if no harm has come to the patient and if it's a relatively minor error but you will tell the person who made the error about it so they won't make the error again." Junior Doctor, 0019* *"I think if we find something that's wrong or not working effectively or just isn't right, we want to learn from it." Senior Nurse, 0011* *"on the whole they are seen as learning opportunity" Senior Nurse, 0009* *"there's no system in place, I think, really, to learn. Because let's face it, it will be a costly system." Consultant, 0021* *"Whether we then learn enough to not do it again, I doubt as well though" Junior Doctor, 0004* *"Because we're not a unit that does make a lot of mistakes, and I think that's why when there is ones, we're really sad and we do learn from it" Staff Nurse, 0007*

		"So, I suppose some people do them as a means to report something but not because there's any learning to be had. So, I think it's useful if there might be learning from it. But I think just saying it for the sake of saying it just so it's said is a bit less useful." Junior Doctor, 0032 *I don't really feel like it's necessarily a learning experience and times when I've, say, raised a concern about a staff member doing something they shouldn't be doing or making a mistake to their senior. You kind of leave it in someone else's hands to deal with, but what do they then do with that information? Do they actually deal with it? Do they just tell them off? Or do they sit down and try and understand why they did that and provide them with teaching and the additional resource they need? So I think you don't necessarily learn from things in the best way in this trust" Senior Physiotherapist, 0020*
	Blame Culture	*"people don't see it as a blame culture, people see it as a learning opportunity." Senior Nurse, 0022* *"I think the work environment is a no-blame environment, just generally. If I grade it, it is a no-blame environment" Consultant, 0029* *"I don't think I made big mistakes but I'm fearful that when you do people look at you differently. So yes, I'm fearful of that." Junior Doctor, 0027* *any pretence that the NHS is anything other than an entirely blame-oriented culture is complete nonsense. It is just a barefaced lie. The entire NHS is predicated on hunting down, singling out and in some way, shape or form being unpleasant to anybody who can be held responsible for error, even if by and large, errors are system" Consultant, 0026* *"I don't think I made big mistakes but I'm fearful that when you do people look at you differently. So yes, I'm fearful of that." Junior Doctor, 0027* *"there's too many negative emotions left within that whole error reporting thing, which is why I try not to get too involved with it" Consultant 0021* *"I'm also aware that sometimes, particularly junior staff who are inexperienced may find things overwhelming or even just individuals will find them overwhelming" Consultant, 0013* *"but everyone is fearful that that's what's going to happen, and therefore doesn't want to own up to these things. And therefore, we brush things under the carpet and don't learn from these obvious and understandable human errors." Junior Doctor, 0027* *"I think it's that fear of legislation or being disciplined. It's like in this job you're grand if you're doing the right thing or if you don't get caught." Staff Nurse, 0010* *"There's a blame culture, and they don't look after each other" Junior Doctor, 0027* *"And I don't recall ever feeling cornered or I don't recall ever feeling blamed. I always have felt that this is a supportive environment." Consultant 0029* *"I think that we are still very much a blame culture. And as a result, we don't have an open culture where we're going to be able to just feel free to air things we've done wrong because we're fearful of the recriminations bit." Junior Doctor, 0027*
Teamwork	Camaraderie	*"you get a sense of camaraderie because you always feel on the edge" Junior Doctor, 0027* *"If you've got the right people on, including the consultants and the physios and everyone like that, you can communicate and say everybody look, today is hell, this is the problems we've got, everybody just seems to pull together." Senior Nurse, 0011* *"You can tell by looking at the board in the morning with the names if you're going to have a good day or a bad day." Staff Nurse, 0010* *"You know, it's stressful when you see the board and you see the people who are you working with because sometimes you are thinking, okay this shift is going to be okay because I have around people who is going to help me. But sometimes you ask people to help you and they don't. So, it depend of the people" Staff Nurse, 0033*

		"We do try and allocate a buddy system so they have got somebody they know they can call if they need some help, or they'll try and check in on them frequently." Senior Nurse, 0022 *"I feel like if I ever needed help, I could get it." Junior Doctor, 0018*
	Contribution to Safety	*"Appropriate staffing and having support and making people feel comfortable and well trained at the bedside, fit to deal with things." Staff Nurse, 0010* *"We never really let anybody down and we also help and cover the other units as well when we can and stretch ourselves to help other people." Senior Nurse, 0011* "*You got to know what's going on elsewhere but it just really helps everybody understand what the whole team is doing. It discusses safety issues but it also just discusses workload, such as we're really busy here or we may be short-staffed here." Consultant, 0013* *"All the senior nurses knew and were able to guide us on things like monitoring calcium and filtration and how to manage a filter. You always listened to them because they were so experienced. You always had to listen when they said somebody was unwell and needed to be taken seriously because they just have such a wealth of knowledge." Junior Doctor, 0019* *"I work with two other colleagues on teaching and staffing. So, there are three consultants who are in charge of the junior workforce. We do everything. Like, look at teaching and training. And we do the staffing. And I have had this role, going on for three, four years now. And we always replace each other very smoothly, very easily. So, if I am busy with something, they will take on my part. If they are busy on something, I cover for them. And I had, honestly, zero issues in the last three years. So, that's really useful." Consultant, 0029*
Stress	Responsibility	*"I end up taking on a lot of non-clinical commitments, which I didn't necessarily consider to be part of my job role when I took the job on" Physiotherapist, 0017* *"Although I am an experienced clinician, how our structure works, you don't necessarily get exposed to all of the managerial tasks that you have to as you go higher up the ladder. So I've had to learn a lot about that side of thing" Senior Physiotherapist, 0020* *"I think you feel unsupported and I think you feel that all the responsibility lies with you." Consultant, 0026* *"But we've had to step up into that role. And there is a lot of things that that is beyond me, however there is no one there, so I've had to do these things" Senior Physiotherapist, 0020* *"you are by your own and sometimes it is stressful." Staff Nurse, 0033*
	Coping with errors	*"I have members of my team that take everything and they will literally think about it for a very long time and I do worry about their wellbeing away from work if they're continuously thinking I didn't get to see all my patients today and taking that burden." Senior Physiotherapist, 0015* *"So I think when we do something wrong, we're really frustrated with ourselves, because we're usually quite good at planning. We like to plan things out, we have to have things written down. In that sort of sense, I think I get really upset with myself, because I'm like, damn!" Staff Nurse, 0007* *"I think we just get a bit sad about that, because we don't ever like to think that we're doing the patient any harm, or any missed care. I think we like to care for people." Staff Nurse, 0007* *"I think I'd be distraught personally. I guess it would depend how they pointed it out to me. I'd probably have a good old cry, but that's my personality as opposed to them pointing it out." Physiotherapist, 0017* *"she's taken it very personally and got very upset about it, which is understandable. When you're in them situations, you blame yourself because you're the nurse, you're the responsible person for them" Senior Nurse, 0022*

		"I think people do take errors very personally. And I see a lot of that. And no matter how much you put a system that is a no-blame system. And you put a supportive system. When you do a mistake, you feel bad and you take it personally." Consultant, 0029 *"I shouldn't but I take it so personally and it would just be like, oh, this is the worst thing, this is awful. I don't know why, but it's such an exaggerated response, I don't know, because we're not really expecting to make mistakes." Junior Doctor, 0025* *"I think you can get into that situation where you think you're tearing your hair out thinking I've done everything I can do, I don't know what else I can do. It's not working. We need more staff, we need whatever. But there's always somebody else to go to." Senior Nurse, 0011* *"I know that it feels very bad when someone else points it out… When someone points it out in the nicest possible way, I'm still very upset I made the mistake." Junior Doctor, 0006* *"But at the end of the day, I'm just human, and out of all my shifts and all my minutes [?] and all my infusions, to make one… I think you learn that with time, maybe not to be so hard on yourself" Staff Nurse, 0010* *"So, you know, I hope that if I made a mistake and somebody see it I hope they will tell me" Staff Nurse, 0014*

Appendix 6. Qualitative Data supporting the impact of the working environment thematic framework.

THEME	SUB-THEME	SUPPORTING QUALITATIVE DATA
Increased Job Demands	Inadequate Staffing / Poor Skill Mix	*"People have tried to work up the skill mix and the patient workload and they've done the best that they can do." Senior Nurse 0009* *"just a lack of staffing and a bad skill mix." Staff Nurse, 0010* *"I think when there are no beds or there are beds but there are not nurse sister staffed, those beds, I think that some of it depends on the seniority and the experience of the nurse in charge as to how difficult it becomes." Consultant Doctor, 0026* *"For the nursing staff, it directly affects how many patients we are able to admit. From medical side, it doesn't affect how many patients we admit. It affects sometimes how much work you can do. Non-urgent stuff may be delayed if you think you haven't got enough people around." Consultant Doctor, 0013* *"When you can't spend that time with someone, it's really frustrating and you feel a little bit worthless, and that's purely because you're, like, actually I can only see this many patients today, and these are the ones that are most important. Even then you can't do as much as you'd like to do with them." Physiotherapist, 0017* *"the only thing may be lack of nursing staff, although they do try and are doing what they do do, I feel like there's a potential, particularly overnight, for there to be more problems" Junior Doctor, 0005* *"It used to be very short staffed from a doctors perspective. But they have increased the number of people, particularly on nights. So it feels better. But from a nursing perspective, I think it's chronically short staffed and it's getting worse all the time." Junior Doctor, 0006* *"Especially when it was poorly staffed and a lot of the burden of work would be put on the anaesthetic trainee." Junior Doctor, 0006* *"So whereas if you had somebody that's slightly more experienced they might be able to deal with that situation themselves. And you might be able to carry on hopefully supporting others but at the minute we find we're not supporting our staff." Senior Nurse, 0009* *"It's because most of the time the nurse in charge you're firefighting staffing issues" Senior Nurse, 0009* *"she's almost in tears because she knows that all these shifts are going to be short staffed" Senior Nurse, 0009* *"Now we've got more bad skill mix, we have a lot of agency. And this is literally since mid-December, we went pretty downhill here nursing-wise. We're really struggling and there are more resignations to come as a result of it." Senior Nurse, 0010* *"The staffing being the issue as well, having agency nurses in that are clueless and not skilled and you're literally doing the work of two, because they're coming and getting three times your wage, and this isn't for all of them, but some come in and are terrified, they do not know what they're doing. You're actually trying to just protect that patient again." Senior Nurse, 0010*
	Physical Layout: The impact of side rooms	*"if you're in the side room supporting them, there's 15 other patients that you're not supporting either" Senior Nurse, 0009*

		"One side is much more isolated. There's a bay, some side rooms, another bay, some side rooms, and that can be quite difficult because you find something's happening and you knew nothing about it." Junior Doctor, 0006 *"It completely depends on the patient you're looking after. If you have a very sick patient, then I would say the bay's a better place to be, because it's more supportive" Staff Nurse, 0007* *"If you're in an isolation room it can be challenging," Staff Nurse, 0007* *"I think perhaps if you were dealing with a patient in an emergency in a side room, obviously there's slightly less room, because all the side rooms, I think, were negative pressure, so it had a double door system. So getting emergency equipment into the side rooms was more difficult, but on the whole I didn't find it that different." Junior Doctor, 0008* *"Yes, I mean a) you haven't got your eyes on so you're hoping that they will make you aware of issues as they come, but sometimes as a more experienced person you could probably see those issues happening before they do. But you can't if you're not in the side room" Senior Nurse, 0009* *"If you have a junior in the side room and the patient is a little bit fidgety that's more of a stress if you're in charge because you've got to try and make sure they're more supported so it's up to the allocation really" Senior Nurse, 0009* *"It really depends on how sick your patients are or your patient. If you're in a side room with a crashing level three, that is really hard if you run out of stock, and you're not allowed to leave a level three ever on their own, but if you've no drawing-off needles, you're pretty useless in that situation, and if the floor had been slammed and you're going, guys, help, it can be pretty hard." Staff Nurse, 0010* *"It actually depends on the member of staff. It's difficult to allocate sometimes because of the skill mix of the staff that you've got on that shift. So you have to think sensibly and you have to really think who has the skill to allow them to be left alone in an isolation room. So sometimes, depending on the patient that's in there as well, you can put a more junior person in there because it's safe to do so. But then they really have no idea what's going on outside. They don't need to know, but they might feel differently because they don't know." Senior Nurse, 0011* *"Some people feel isolated in an isolation room" Senior Nurse, 0011* *"Both but in a different degree. Because if you are in an open bay, let's say you are in a four bedded area. Even though things get busy, because there's only four patients so it's still manageable. If you're in eight bedded, if it's busy it's eight patients. So it becomes busy. You'll really find it disorganised, even if things are organised. Because let's say I'm the deputy in that bay, because I'm not only looking after my patient, all my avenues are open. My eyes, my ears, I want to know what is happening to every patient and I want to know what is happening to my colleagues and my staff and that kind of thing." Junior Nurse, 0012* *"But when you are isolation rooms, for me, if you get a really busy patient in isolation, the problem is if you want to ask for help, you feel like you're isolated. It's difficult to ask for help." Junior Nurse, 0012* *"But every moment you come out of the isolation, two, three minutes counts. So that is the difficulty when you're in isolation. But all the care will always be the same regardless of if you're in isolation or in your eight-bed area." Junior Nurse, 0012* *"The extra logistics required for someone to be in a side room all the time, even for short periods… Although level three patients will have one to one, in the open bay someone*

		can nip out and go and get something, disappear for one minute and someone will cover across. In a side room that's not possible to do." Consultant Doctor, 0013 *"So you have to get someone else to go into the side room or go and fetch what you need. So that would mean we need more runners or that sort of thing to help support that or sometimes the doctor will say, I'll sit here for two to three minutes while you go and get the things you need to go and get. Or even running a blood gas for instance to see how a patient is doing, you can't just leave the room and go and do your testing." Consultant Doctor, 0013* *"I suppose the other thing with the side rooms is you tend to go in less" Consultant Doctor, 0013* *"in the side room the stress can come if you're not supported by the people outside the side room." Junior Nurse, 0014* *"Yes, but, of course, in the open bay you can go and get your stuff, you know. You can do ABG whenever you want. In the side room sometimes even to go to the toilet you need to plan because you can't leave the patient on his own." Junior Nurse, 0014* *"I'd imagine, if I was the only person in the side room, for example if I was a nurse, all day, I think I'd find that quite isolating, but at the time I'm in there I'm often in there with someone else, so it's not too bad." Physiotherapist, 0017* *"there's a slightly different level of care, I suppose. Often, people in the side room have pretty strict contact precautions. It is more difficult to have an interaction with the nurse or with the patient because they have to scrub up" Junior Doctor, 0018* *"I guess more could happen. I was a little bit nervous making... To a patient in a side room without people being alerted rapidly" Junior Doctor, 0018* *"So sometimes in the side room you do feel a little bit like, oh, this is quite scary" Junior Doctor, 0020* *"And they can get bored and the lack of interaction around them can frustrate them, particularly if they are challenging patients in there." Consultant Doctor, 0021* *"The nurses are a little bit isolated in the side room" Consultant Doctor, 0021* *"I rely on the bedside nurse to tell me more information because I've not gone in there as much. And I rely on the junior doctors who may have been going in there more often to tell me" Consultant Doctor, 0021* *"Junior nurses I know find it very stressful. Stressful because they're in a new environment. Their stress levels are higher because they feel a bit isolated, especially because a lot of our side rooms, we have to keep the door shut because if the patient's infected, it's then about making sure that we're cohorting them properly." Senior Nurse, 0022* *"But I don't think that's cohesive, it doesn't work well with teams, nurses, camaraderie, because you're then left with isolation." Consultant Doctor, 0023* *"I can imagine in an open bay, the difficult family are somewhat diluted because there's other nurses literally across the way who can just come across and intervene and offer help, so I have issues with side rooms." Consultant Doctor, 0023* *"I'd much rather have the sicker patients out on the main bay where I can keep an eye on them than in the side rooms." Consultant Doctor, 0024*

		"And it reduces your accessibility, the accessibility of the patient to you and also your accessibility to the nursing side" Consultant Doctor, 0024 *"It's an inconvenience. It makes the job slightly harder to do but it's just one of those... It's one of those things that there isn't any other real way of doing it." Consultant Doctor, 0024* *"But when you're in side room and there's just you and a nurse, they will constantly be going in and out. If things change, there's no one to… If you're at bay, you speak to the nurses looking after that patient, would you come over and help me? Whereas I've definitely felt in a side room you're on your own quite a lot of those times when things are changing." Junior Doctor, 0027* *"But I think in intensive care especially it's difficult because often you're in a side room by yourself. And especially when I was new in those scenarios I would often feel like there wasn't necessarily enough senior support around." Staff Nurse, 0030* *"Yes. It is more stressful because you don't have… Because you are not allowed to let a patient alone, level three because safety. So, if you need something from outside or if you need to ask something, you only can call from inside and ask, and if they are busy, someone can't come to help you in your side room. So, you can say that it is more stressful, but it is because you don't have the support that people have if you are outside and you can move" Junior Nurse, 0033* *"Sometimes I like it because you are on your own and you are not being asked to help other people. I mean I don't mind to help people, but you can't focus on your own patient. It has good things and bad things." Junior Nurse, 0033* *"But then what I find when you're in the eight-bedded bay, if it gets busy, everyone is suddenly sinking. Because you could have two admissions, you could have a couple of agitated patients, and even though you're helping each other, that can be really tiring, because even if your patient's fine, you sometimes have to abandon them to help the other two nurses, where I've seen I can have a patient, and just because if they're sedated, in paradise, you leave them be and hope the alarms catch something, because the next person, you need to really help someone out." Staff Nurse, 0010* *"in the bay it's a bit more stressful" Staff Nurse, 0010* *"If you're in eight bedded, if it's busy it's eight patients. So it becomes busy. You'll really find it disorganised, even if things are organised." Staff Nurse, 0012* *"Of course, if you are in the bay, even if you're patient is safe and it's stable, if the patient of your neighbour is quite sick, you're going to get the stress from it as well. Not in the side room if your patient is stable. Your patient is stable unless you made a mistake or something happen suddenly, you know." Junior Nurse, 0014* *"And when I was thinking probably that the, you know, how the buildings are, how the rooms are, that definitely affect your relationship, yes" Senior Nurse, 0016*
	Requirement to move patients	*"I think it causes more stress to the medical team, especially the consultants. The nursing staff, we can move all over the place quite frequently. You're never going to necessarily go back to the same bed space two days in a row, because your shifts are changing. I think for the medical team, especially the consultants, because they do a week at a time where they're the consultant for whichever side of the unit, they get to know the patients a lot deeper and they get used to the patient being in a certain way." Senior Nurse, 0022* *"we'll try and minimise the moves because it is stressful for everyone involved for doing it, especially if we then have to reallocate nurses." Senior Nurse, 0022*

		"It impacts in a number of ways. First of all, patients move around a lot because of that. So in order to optimise our staffing ratios, because you can't look after two patients at the same time in two separate side rooms, when we need to double patients which we do now in HD as well as in ICU, once people are no longer level three, assuming they can't come of a side room because they're not infected, etc. then we move them around a lot. So that impacts on everybody's workload, moving them around." Consultant Doctor, 0013 *"It is a massive stress for the nursing staff. And I think they are exhausted by the end of the day. So, the nursing charge feels they spend more time moving, shipping patients around the unit to cohort them together than supporting nursing staff doing their nursing work." Senior Nurse, 0031* *"So, that was tricky because sometimes three times in a shift they'd move a patient and it became... And often actually often from one side to another which meant they changed teams. So, they would sometimes move a patient from one team to another in the middle of the night which is probably not the best thing to be doing." Junior Doctor, 0032* *"think it causes more stress to the medical team, especially the consultants. The nursing staff, we can move all over the place quite frequently. You're never going to necessarily go back to the same bed space two days in a row, because your shifts are changing. I think for the medical team, especially the consultants, because they do a week at a time where they're the consultant for whichever side of the unit, they get to know the patients a lot deeper and they get used to the patient being in a certain way." Senior Nurse, 0022*
Low Decision Latitude / Loss of Control	Lack of control over incoming workload	*"So that's difficult. The consultants always want to have… If they've got patients knocking on the door and there's an empty bed they want it filled. Whereas nursing management they will say: Okay, you have got staff for 12 patients" Senior Nurse, 0009* *"We are constantly expected to achieve results without the resources" Consultant Doctor, 0024* *"It's a bit of a stress trying to get a bed, but it's not really something that I'd get involved with to be honest. Junior Doctor, 0025* *"Because especially when patients are deteriorating, and I always think that the stress levels seem to be increased at nights because there are less people around, and certainly in terms of doctor staff, maybe not so nursing." Junior Doctor, 0027* *"they're quite stretched overnight, because we have some patients with a very high acuity so they're very busy" Junior Doctor, 0007* *"But it is a very busy department. And, at some point, we were very overwhelmed. And we were at a very high risk of being burnt out. All of us. Consultants, juniors, nurses." Consultant Doctor, 0029* *"I mean, sometimes it's physical beds but I found it much more frustrating when there was like two empty beds but they couldn't admit the patient downstairs because there was no nurse to take them. But I found that much more frustrating that when there are... that when the unit is full and they're full of sick patients and it's like, well, you know, it's going to happen." Junior Doctor, 0032* *"Only in the sense that you'd be limited by beds. Very much here at [redacted], you would have physical bed spaces, but they couldn't find the nursing stuff." Junior Doctor, 0027*
	Physical Layout: Infrastructure	*"That can make patient care a bit more difficult because they don't know the systems. That might have a slight impact on our ability to deliver safe, effective care, the locums. It's a system problem that's quite difficult to fix". Junior Doctor, 0018*

		"Our taps, our plumbing here's crap, half our sinks don't work. They either work really forcefully with boiling hot water or a little dribble at all, and we've so many sinks that have had to get replaced. Sometimes it's infrastructure. We had a roof that fell through in the four-bedded bay one day." Staff Nurse, 0010 *"We've doors here that don't work. There's a door in an isolation room and you have to rip it open, and, honest to God, I was there all day yesterday, and my shoulder last night, trying to open that heavy door all day. There are a few things estates just don't fix. We had broken chairs for ages. Computer chairs, they would randomly just drop down when you were sitting on them." Staff Nurse, 0010* *"I'd like to have more beds and the staff to deal with them." Senior Nurse, 0011* *"If I can change one thing, staffing. It's quite different when you are fully staffed compared to you have less staff. Because if you have less staff, the idea would be to lets' say you would take two patients. And sometimes fi you're tied up, you get a double level three patient and a level two combination. So, I think if I could only change things, I would hire more people. Well-staffed." Junior Nurse, 0012*
High Decision Latitude	Physical Layout: The impact of side rooms	*"If you put a more senior person in there, they have a handle on what they're doing in the room and whether it's because of their seniority, interest, nosiness, whatever, they can find out what's going on outside as well." Senior Nurse, 0011* "*If you've got somebody like we had the patient in one of the isolation rooms. And so he was very unwell but we added somebody reasonable in there so had confidence in what they were doing." Senior Nurse, 0009* *"Some people like the peace and quiet because you're not bothered by everyone else around you" Senior Nurse, 0011* *"You're left alone to do what you're paid to do and that's look after that patient. So it just depends on the patient and the nurse at any time" Senior Nurse, 0011* *"Yes, I think especially the junior nurses, not so much with the senior nurses. Years of experience plays a part in it. I think a lot of our more senior nurses quite like having a quiet shift in a side room, even if the patient's quite busy. A lot of them are quite experienced that they can deal with pretty much anything that's thrown at them and they're quite comfortable in their remit that, actually, they're very quick that if they think it's getting out of their comfort zone, they would escalate it very quickly." Senior Nurse, 0022* *"I also think side rooms are good for a number of reasons in that patients prefer them, some of them. The awake patients it's variable, and it depends where you are but you can have more relatives in and you can have isolation and you're protected, you have independency, you have privacy, so there's an advantage" Consultant Doctor, 0023*
	Physical Layout: Infrastructure	*"our coffee room is where we do our handovers, it's where we have our breaks, so you're constantly re-engaging the group." Senior Nurse, 0022* *"by maintaining our one staffroom, we've maintained the team. You could be working the complete opposite side of somebody but you go on break but it's nice to talk to someone, how's your day going? You're maintaining those relationships. I think that's helped us really well as a team." Senior Nurse, 0022*
	Presence of Senior Support	*"It's hard when you're working against maybe management that aren't supportive or care that much because it's just a job at the end of the day to them." Staff Nurse, 0010* *"I didn't ever think it was inadequate in senior nursing or the senior medical." Junior Doctor, 0018* *"I always felt that as though there was someone I could go to for help and was really well supported." Junior Doctor, 0019*

		"anytime I needed help I could get help. The registrar always picked up their bleep. I think they always knew it was me and there was an associate registrar that you can get hold of down the corridor. We were always told that we could shout…" Junior Doctor, 0019 *"But when it was like that, they would feel like they were doing all the grunt work and their opinions weren't valued that much when they had opinions about management" Junior Doctor, 0006* *"We're fortunate that our doctors are based on the unit and are accessible on the unit" Senior Nurse, 0009* *"I feel like if I ever needed help, I could get it. If I was doing a procedure and something was going wrong, I could summon help quickly. It's a physically small area on a single floor. If you wanted help, you can say, help, please." Senior Nurse, 0018*
Negative Psychological Effects	"Stress"	*"It's more stressful because you're short staff and you're having to cover for your friends or you're having to look after more patient than you are supposed to be" Senior Nurse, 0016* *"we can't come back because we're also really short staffed, so we're really inflexible with our time. It just does create a bit of tension at times." Senior Physiotherapist, 0020* *"So, if the capacity issues are nurse driven, we can't get them into a safe environment, the yes, definitely, it has impact on my thought processes and my mood." Consultant Doctor, 0023* *"In terms of safety, staffing is one of the things that makes me nervous and makes me stressed." Consultant Doctor, 0026* *It's very frustrating, because, you know? We should be providing the best possible care. I know there is, you know? Cost factors coming into play and so on. But in an ideal world, this patient should not die. They should be treated 24/7. And the outcomes should be better. It is frustrating." Consultant Doctor, 0028* *"Nights and weekends can be difficult because, again, if you've got lots of complicated patients, there's one patient there and you're having to deal with all sorts of other things as well, that can be difficult." Junior Doctor, 0005* *"the only time I would actually sometimes feel alone would be on nights when the registrar would be away assessing someone on the wards and you'd be on the unit on your own." Junior Doctor, 0019* *"Because especially when patients are deteriorating, and I always think that the stress levels seem to be increased at nights because there are less people around, and certainly in terms of doctor staff, maybe not so nursing." Junior Doctor, 0027*
	Perception of own inadequacy	*"but some come in and are terrified, they do not know what they're doing. You're actually trying to just protect that patient again." Staff Nurse, 0010* *"obviously much more unhappy because they're spread across multiple patients" Junior Doctor, 0006* *"That is stressful. It is really stressful because even if you want to do your best, if you don't have enough staff, things can be delayed for the patients." Staff Nurse, 0033* *"When you can't spend that time with someone, it's really frustrating and you feel a little bit worthless, and that's purely because you're, like, actually I can only see this many patients today, and these are the ones that are most important. Even then you can't do as much as you'd like to do with them." Physiotherapist 0017*

Appendix 7. Topic Guide for Qualitative Interviews – Influence of Personality

THE INFLUENCE OF PERSONALITY ON PSYCHOLOGICAL SAFETY, THE PRESENCE OF STRESS AND CHOSEN PROFESSIONAL ROLES IN THE HEALTHCARE ENVIRONMENT
Version 0.2 26/07/19
IRAS Project ID: 263876

16PF Feedback and Qualitative Interview Topic Guide

Welcome
Introduction, overview of session

- Welcome, introduction of researcher and project aims
- Overview of plan for study:
    - A short interview which will be recorded, explanation regarding data handling and anonymisation of transcripts.
    - 16PF feedback: Results presented as a written report, individual will take away copy to keep. Explanation that this feedback will not be recorded.
- Review of PIS and completion of written consent form
- "**Feel free to ask questions at any stage"**
- "**I may make notes so that we can return to a topic later in the interview"**

Qualitative Interview

"We will now move on to a short interview to explore your opinions of stress within the working environment"

Perceived Stressors

- What are your experiences of working under stress in the clinical department you work in?

- Experiences of stress at work – Do you find your working environment stressful? Is it always stressful?

- Do you enjoy the environment you work in?

- Coping strategies for stressful environments

- I am now going to read out a list of the 5 most common clinical stressors – can you please rank these in order of which you find most stressful?

Personality

- Do you see differences in personalities at work?
- How do you think your personality affects the way you manage stress? If at all?
    - Explore aspects of the participants personality that are both beneficial and detrimental

- Does this have an impact on the team?
    - Positive and negative experiences
    - How do you manage different personalities within the team?

Psychological Safety

- Do you feel able to raise concerns within the team?
- Do you think it is beneficial that all members of the team are able to raise concerns?
- Please state whether you agree/ambivalent/disagree with the following statements, thinking about your experiences within your current workplace
    - **"If you make a mistake on this team, it is often held against you"**
    - **"Members of this team are able to bring up problems and tough issues"**
    - **"People on this team sometimes reject others for being different"**
    - **"It is safe to take a risk on this team"**
    - **"It is difficult to ask other members of this team for help"**
    - **"No one on this team would deliberately act in a way that undermines my efforts"**
    - **"Working with members of this team, my unique skills and talents are valued and utilised"**

Stops Audio Recording for16PF Feedback

16PF Feedback

- Explanation of 16PF results by taking participant through written report
- Time for discussion and possible meaning of results

Sum up short qualitative interview and 16PF feedback
Provide opportunity for any questions or further discussion
Provide participant with the following information

- If you wish to follow ay issues you have talked about, you can contact us (provide information)
- They can withdraw from the study at any point and their data will not be used

Thank participant for their time.

Appendix 8. Supporting qualitative data for the influence of personality thematic framework.

Theme	Subtheme	Supporting Data
Teamwork	"Fitting in"	"I think that's a bit of the thing about if you don't fit the mould, then it's harder to fit you into the work environment that everyone else is heading towards" 0035, Consultant, Emergency Department "And one of the reasons that I joined is personality based, because I consider my personality a bit outside the rest of the team and I'm a bit different with them. In terms of pressure I'm more chill, I'm more cheerful." 0049 Staff Nurse, Critical Care "I won't take everything too personally, I just accept that people deal with different things very differently and they are very different. And sometimes everyone has a bad day and everyone has a good day. That doesn't make them a bad person." 0055, Sister, Critical Care "You do also get some of the quieter type as well, but it's usually the quite confident people that you find are A&E nurses, because you have to be able to think on your feet quiet quickly." 0037, Staff Nurse, Emergency Department "I think being a certain type of personality helps for the ED, personally." 0069, Consultant, Emergency Department "I think different personalities, because it's such a big team, but there's a lot of people, relatively short attention span, variety, a bit of excitement, teamwork." 0035, Consultant, Emergency Department
	Impact on team dynamics	"Personalities always affect the teamwork, unless you realise that everyone is very different and you accept the fact that everyone is different. Sometimes, people clash, but that's not because anyone wants to clash, it's just because we are different." 0055, Sister, Critical Care "It's a totally different dynamic depending on who's together, and it's not even always about, sometimes, but it's not necessarily about individual personalities, it's about the people that get together. So, if you get five people that really like to complain together, then it's just a really dreadful shift. Or five people that are a little bit lazier than everybody else, then it's like, can you just do your work and focus on what you're supposed to be doing?" 0083, Staff Nurse, Emergency Department. "Yes. I do feel that way. I think there is a bit of… I mean, it's a biased view, because I might feel some personalities more soothing as compared to what somebody else might think. So it's quite subjective, but that's true. I mean, if I know that I'm working with certain people

		for the entire week, and if I know who they are and how they think, that always puts me at ease." 0087, Consultant, Critical Care "it's just sometimes it depends on certain people, and their personality, or sometimes just a certain constellation that stresses us so much, that we all lose our temper a little bit." 0092, Consultant, Critical Care. "But it's like little dream teams that I know if they're all going to be on shift together put them all in the same place those patients will be fine. But even if they're not particularly friends they'll all work together they will get in touch. And if you put them without a little support system they don't work quite as well even if they're great independently." 0068, Senior Staff Nurse, Critical Care "I'll offer help for people that you know will take it, but you know some people, they just like to do everything themselves. I think it's just getting to know people and knowing when they're having an off day and if and what you can do to help them." 0086, Staff Nurse, Critical Care "there are definitely a few personality clashes within the team, but we're quite a small, close-knit team." 0056, Staff Nurse, Critical Care "I think personality always influences with how we decide and how we think, how to handle any particular situation." 0087, Consultant, Critical Care "some people are quite… Pushy is not the right word, they are quite upfront and they won't hesitate to express their views, and they can get things done very easily." 0087, Consultant, Critical Care "They get really stressed very easily. I think in that situation, once someone who's a lead, you can visibly see them stressed, it has a really negative effect, a knock-on effect of everyone else. So instead of positively influencing people, it's actually quite negative." 0089, Staff Nurse, Critical Care
	Conflict	"But it kind of makes it a little bit harder as well, because you do get personalities and I think you get big personalities in ICU anyway. But you can get a little bit of eye-rolling and what have you and this kind of thing going on." 0080, Staff Nurse, Critical Care "It's a personality thing sometimes I think and when you're new to an environment people's attitude towards you can kind of be funny." 0080 Staff Nurse, Critical Care "The only issues I had maybe was personality clashes, but I guess that's normal in any workplace." 0086, Staff Nurse, Critical Care "But I've had a few tiffs with people, but like you said, it's been more personality wise." 0086, Staff Nurse, Critical Care

		"I think that's probably because of the perhaps overly perfectionist attitude that I have, where I don't particularly like to be in a situation where there's conflict, which is perhaps unrealistic." 0075, Physiotherapist, Critical Care
	Psychological Safety	"I think often it's a choice of who you would go to and that's probably in terms of personality and how you get on with some people." 0042, Junior Doctor, Emergency Department "I usually tend to say what I think." 0047, Physiotherapist, Critical Care Department "It has to be with personality in the way that some people will be more comfortable naturally to speak up. But to establish a normal speaking relationship and instead of using it as a concern, just friendly talk about it. Different people will approach to that thing differently, but it is one of the most important things in intensive care to speak up." 0049, Staff Nurse, Critical Care "I'm finding that it's difficult to ask questions. I feel like I shouldn't be the one asking questions." 0070, Junior Doctor, Critical Care "I think because I'm normally so chilled as well, and that's another reason why people come to you and unload as well, so I think a double-edged sword, and it's useful in clinical practice." 0072, Senior Staff Nurse, Critical Care "I think, most of the time, you can raise concerns with, as expected, variability between who's on and the different personalities. So, I suppose it's, with certain people, raising it in the right way. Yes." 0075, Physiotherapist, Critical Care "But then again, it kind of does depend on the personalities around you, if you do have a hectic day and you do need help from the person in the bay next to you. I've had shifts where people have been brilliant, but I've also had shifts where you were just ignored and can you get somebody else to do it or you know." 0080, Junior Doctor, Emergency Department "Well, we'd hope they'd be able to, but sometimes they don't. And that's maybe personality." 0084, Staff Nurse, Critical Care "Although I mean that's personality, as well, if someone doesn't always want to ask for help. I can think I'm not going to ask for help until I'm really at my limit and then I thought I actually should have asked for help before" 0084, Staff Nurse, Critical Care "I'm not the person who will challenge the senior people… But it depends on the consultant as well, it depends on the personality." 0090, Senior Staff Nurse, Critical Care

Individual Personality Traits	Impact of one individual on the environment	"So it's the people who are resistant to change that really frustrates me, and there are a few people in my department and within my consultant body who are like that." 0038, Consultant, Emergency Department "But I do know, just that, depending on who's on the unit or who is in charge of a particular scenario, obviously you'll see things work different." 0050, Senior Staff Nurse, Critical Care "My colleagues, particularly my senior colleagues, i.e. my consultant that I'm on with, can change the level of stress." 0079, Junior Doctor, Critical Care "From the consultants on to the registrar that you're with or if you're on your own, and your juniors, and the nurse in charge of [unclear] can totally, totally change your day." 0079, Junior Doctor, Critical Care "Whether or not a day is stressful can also depend on who you're buddied up with more than anything. And I'm buddied up with this person; it's going to be a long 12 hour shift. But the same goes in the other direction and you're great, I've got so-and-so, this is going to be fun." 0081, Junior Staff Nurse, Critical Care "Anybody who's got a stressed personality I feel can influence outcomes because we all need each other within the facility." 0091, Staff Nurse, Critical Care "So those are few people that were noticeably very stressed, and then other people would get stressed around them. And normally I'm the opposite and it's okay, but there were parts when I'd get a bit like that." 0072, Senior Staff Nurse, Critical Care "if the department is a lot busier and you are working with people that are likely to get stressed a bit more easily, then, yes, that would be, definitely an influence." 0040, Staff Nurse, Emergency Department "But also it's the different personality types. But also just the day and how people are feeling because you can have the same team on one day and it works really well, and another day it just doesn't work so well for whatever reason. There's not a particular kind of trigger point, but I guess if one person is in a bad mood it makes everyone else into a bad mood." 0046, Sister, Critical Care "So you'll know when a particular consultant and a particular nurse in charge [unclear], it's not going to be smooth sailing." 0069, Consultant, Emergency Department.

		"Our one person who can totally change the mood of the scenario, nobody's on edge not doing their best, because if you're relaxed, most of the time you actually get the job done better. But one person can put… That doesn't have to be a consultant, it can be, not even the nurse in charge, it can just be one person in that team that it'll just put the whole team on edge. And that can make a whole difference in the scenario really." 0050, Senior Staff Nurse, Critical Care "And actually, I think sometimes it is useful to have those people on the team. But yes, there are some people that are just generally, quite, potentially, quite negative and that… You could feel that atmosphere depending on who was on." 0051, Sister, Critical Care "One person in particular, when she is in charge on shift we all sigh a breath of relief. And we just sit back in our metaphorical deck chairs and we're just like, yes she's on we don't need to worry. She's got it. She's got it. She's just amazing." 0071, Senior Staff Nurse, Critical Care "I think if you're a bit flappy or disorganised and all over the place it rubs off on other people, I definitely noticed that." 0072, Sister, Critical Care "if you've got someone that's calm and like it's going to be fine, you're going to be okay, I'm here if you need anything just let me know, that tends to make them feel instantly relaxed for the shift." 0072, Sister, Critical Care "Like even today, we had a lovely consultant on, very chilled in the morning, bit more tense in the afternoon and literally just the whole department felt that way. And that, you know, it was a lot busier in the afternoon, so there's a lot more pressures, but I think a calm consultant has a huge influence on the whole department." 0074, Junior Doctor, Emergency Department "Because you sometimes know if you've got one particular consultant in charge or reg in charge, you just know it's going to be a bit more of a stressful day." 0078, Junior Doctor, Emergency Department "Before you even get to work, you just know maybe they're just a little bit less experienced and a bit more anxious about the whole thing, or they just like to be a bit more in control or sometimes they just, I don't know. But yes, you can just… And that's probably just their personality type." 0078, Junior Doctor, Emergency Department "I do think it makes a difference. I really do. It's the ripple effect, all of us feel it." 0085, Staff Nurse, Critical Care "With some members of the team, it was fine, but there was particular people that would make the day difficult…. It's their personality." 0054, Senior Staff Nurse, Critical Care

		"it depends what their personality is, their leadership style, their experience. That has a huge impact on what the outcome of the shift will be and how we will handle all the stresses that will come up throughout the shift." 0076, Junior Doctor, Emergency Department "Well, I think in ICU, because there are so many things involved, anyone is capable of disrupting that rhythm. It could be a consultant from another team who's pushing for beds, or it could be a family member, it could be a patient himself, or anyone really speaking." 0087, Consultant, Critical Care "Yes, if there's a very proactive registrar or SHO and they come round and explain without... Even if they just pop their heads in every now and again just to say like, is everything all right? I think they can have quite a big influence on making it a bit less manic." 0088, Staff Nurse, Critical Care "I'd agree that the consultant and nurse-in-charge are the most important. We have a slightly more complex, sort of, nursing, well complex system in that there are two consultants, so both consultants obviously can affect it, and also we have a floor coordinator who oversees the whole unit, but then a nurse-in-charge on each side." 0092, Consultant, Critical Care "Yes, those kind of personality affects me, it makes it more stressful." 0090, Staff Nurse, Critical Care "I've watched other nurses, for example, who aren't really getting anything done because they're stressed or panicking" 0084, Staff Nurse, Critical Care
	Awareness of impact of own personality on team	"No, my personality or how they interpret my personality has been a challenge for me and for them, but I manage to fit in." 0049 Staff Nurse, Critical Care "I think I have a personality which itself… I mean, I feel that everybody gets that I'm a very approachable person, and I've always had people, and trainees especially, coming to me and sharing what bothers them, even during [the] pandemic. And I'm always very supportive of them, and I will do what I can to help them." 0087, Consultant, Critical Care. "It just takes one person to lift the mood, to lighten the mood. I feel that because I would be quite goofy and stuff, and I would probably tell a few jokes on the ward round, just to lighten things." 0089, Senior Staff Nurse, Critical Care "And there were times when I'd probably snap or I'd hurry people on and say actually no I don't have time for this, I'll speak to you later on or whatever. And that's just not how I normally would communicate with people, and I'd notice that I was getting stressed at that stage." 0072

		Senior Staff Nurse, Critical Care. "I'm quite level and externally people really don't see much difference. I'm quite calm." 0035, Consultant, Emergency Department "So I think I very much had a let's just get on with it type of attitude. Which I know can be quite annoying for some people, because it's, oh actually I don't want to get on with it, this is a horrible situation, so stop being so perky." 0051, Sister, Critical Care "And then I definitely noticed I'm normally quite calm. I don't shout at people. I don't tend to get that stressed, and I'm normally quite relaxed." 0072, Sister, Critical Care "I mean hopefully, but when I'm in a cardiac arrest, if I'm the nurse in charge, I'll step back and let people do what they want and try and direct people to do certain things if they're not being done. And try and get people involved as much as possible. So hopefully that'll make it relaxed because I've been there forever." 0050, Senior Staff Nurse, Critical Care
	Suitability for role	"in A&E you get rewarded for being confident, because it makes the seniors less stressed." 0034, Junior Doctor, Emergency Department "I'm very extrovert anyway, so that's why I can't have a proper career anywhere. So yes, I'm very outspoken" 0076 Junior Doctor, Emergency Department "I wouldn't consider myself a very shy person, which helps but I think it comes under that whole fear of me not doing enough and not doing a good enough job." 0062 Physiotherapist, Critical Care "on a baseline personality, I'm quite confident." 0092, Consultant Critical Care "I quite like high pressure, quick decisions, moving fast." 0041, Junior Doctor, Emergency Department "You do also get some of the quieter type as well, but it's usually the quite confident people that you find are A&E nurses, because you have to be able to think on your feet quiet quickly." 0037, Staff Nurse, Emergency Department "My personality type is I'm not comfortable with a long waiting time and I'm not comfortable feeling out of control so I feel best when it's a manageable list of patients." 0039, Junior Doctor, Emergency Department "I quite like high pressure, quick decisions, moving fast. I would say I've got a four-hour attention span so that's why I'm good at ED. But then I

		also quite like having a chat to people. I quite like meeting people. I'm quite personable that way. So I've got this sort of best blend of both of them." 0041, Junior Doctor, Emergency Department "I'm quite good at forgetting about things when I need to work." 0046 Senior Staff Nurse, Critical Care "I don't know if personality and mindset are the same thing, I don't know, but the way I look at things, I'm like if I get stressed I can't do my job best that I could do it." 0046 Staff Nurse, Critical Care "I think that's part of the reason I'm in emergency medicine is, it's not about a long lead in and prepping the surgery or anything like that. You've got to respond to the thing in the moment. And so, if there's something about the ability to handle uncertainty." 0052, Consultant, Emergency Medicine "I'm fairy chilled, I am not a control freak by any stretch of the imagination. So not knowing what's coming into my day is actually good for me, because I like variety. I'm not interested in doing the ward round on Monday morning for two hours and then clinic, that's my idea of hell." 0052, Consultant, Emergency Medicine "there's no point in my becoming upset about things that I can't control. That's an aspect of my character, which I think I'm sometimes grateful for, and sometimes ashamed of, that I will just accept what's happening and get on." 0059, Senior Staff Nurse, Critical Care "I think I'm quite an organised person normally. So, I have an order where I do things. So, that helped. I'm very clean as well. My bed space was always quite clean." 0065, Staff Nurse, Critical Care "I think being a certain type of personality helps for the ED, personally…… I think I'm very much a kind of doer and I make… Any decision's better than nothing. So I think that suits emergency medicine quite well. 0069, Consultant, Emergency Department "I think generally ITU nurses tend to be the type A personality who expects everything to be done to perfection" 0046, Senior Staff Nurse, Critical Care "I'm confident to work within my competency scope and I'm very confident to ask when I need the help." 0091, Senior Staff Nurse, Critical Care "So, I always try and make a conscious effort to keep myself calm and then I feel like I can do my own job better. So, I imagine it must be

		personality.” 0048, Senior Staff Nurse, Critical Care “I’ve just never had a real problem with containing any kind of stress level or feeling like it’s, all getting on top of me. So maybe that is personality. Yes, it probably is a bit of personality.” 0084, Staff Nurse, Critical Care “So, I think part of ICU is being very methodical, and detailed, and not missing anything, and taking your time, and doing it to the best of your ability. But, then, I stress about my ward round taking too long or I stress about the fact that I still write everything on my sheet, whereas the other consultants breeze around with no sheet, stuff like that.” 0077, Consultant, Critical Care “Some people saying wow, you generally stay quite relaxed, and things like that” 0040, Staff Nurse, Emergency Care “I’ve always been quite an anxious person and I care too much I think about patients and about things.” 0047, Physiotherapist, Critical Care “Not giving yourself enough credit and I think my personality is I’m a bit of a people pleaser and need to know that I’m doing the right thing and doing the best that I can and I think it made me stressed because I wasn’t getting enough feedback.” 0062, Physiotherapist, Critical Care “People tell me that I’m calmer, very calm. I don’t talk much. Even though I am stressed inside, I don’t tend to show it outside.” 0090, Staff Nurse Critical Care
	Individual response to stress	“There are people that are stressed quite easily” 0040, Staff Nurse, Emergency Department “I wouldn’t describe myself as someone that gets easily stressed. I get frustrated quite easily, but I don’t feel stressed.” 0034, Junior Doctor, Emergency Department “They’re very risk-averse and worried about the fact that there could be a diagnosis that they’ve missed, even if it’s not an emergency diagnosis.” 0035, Consultant, Emergency Department “There are people that are stressed quite easily” 0040, Staff Nurse, Emergency Department “Yes it is because I see a lot of people worry, and I know that it factors in many people’s lives.” 0071, Sister, Critical Care “I think some people get very caught up if they are stressed and they let it get to them a lot. Firstly at work, when something’s not going their way, I think some people can find it quite difficult to keep plodding on, you know?” 0088, Staff Nurse, Critical Care

		"I like to feel in control and I can tend to be anxious. So for me, I try to anticipate anything that will make me anxious and prevent it rather than let it happen and deal with it." 0039, Junior Doctor, Emergency Department "Although I'm a worrier, I'm not a massively stressful… I certainly don't outwardly protract the stress." 0051, Sister, Critical Care "I think, in general, I'm not really a stressy person, until it gets to the nitty-gritty, the last minute. It takes quite a fair bit to get me really stressed, in general, and then, obviously, working in that environment, you learn very quickly that you just need to take a deep breath a lot of the time and relax, otherwise it all goes wrong. Because it's organised chaos at the end of the day, I think that's the big thing." 0060, Junior Doctor, Emergency Department "I think my personality has sort of contributed to maybe being seen as a bit more vocal, but also going with the flow when things are quiet and trying to just do other things to prepare for when it will get busy." 0081, Staff Nurse, Critical Care "I think some people perhaps aren't that bothered about whether they get everything done or not and some people yes perhaps they're just a little bit more chilled out than me, a little bit more willing to go with the flow" 0064, Junior Doctor, Critical Care "I think specifically with stressful things I do see a big difference in the way that people handle things. I think some people are straight in there, they're fine, life is fine we'll move on I just keep going, no problem. Other people really need to go off the floor and take a break, have a breather and we'll send you away for half an hour. And I don't think that is even relative to the level of experience." 0068, Staff Nurse, Critical Care "I know it's done in an educational manner but if it's something that if you're someone who naturally would feel bad about those sorts of things rather than being able to rationalise it, you can take that very badly." 0042, Junior Doctor, Emergency Department "I'm convinced that some people blossom in under stress and are able to reach out and become much more team players. And then others retreat back into command control mode and I think that varies also with your team." 0069, Consultant, Emergency Department "I think though some people thrive on stress, that's how they get through life, it's they bumble through stress." 0071, Senior Staff Nurse, Critical Care

		"I think it's the personality of the individuals and their perception of stress and their ability to cope and manage their own stress. And how they can first understand their stress and how they can do sensible things to try and support it so that they can have a better day and that everyone else is safer." 0091, Staff Nurse, Critical Care "So with regard to personalities, I think yes, maybe some people might be able to deal with that situation better than how I deal with it." 0087, Consultant, Critical Care "I'm not really a stressy person, until it gets to the nitty-gritty, the last minute. It takes quite a fair bit to get me really stressed" 0060, Junior Doctor, Emergency Department "I think I'm quite, I don't know what my personality traits came out, but I generally deal with stress quite well, and I am quite relaxed." 0061, Senior Physiotherapist, Critical Care "My personal experiences of stress have been to do with feeling as though I'm not doing enough." 0062, Physiotherapist, Critical Care "But generally when I'm finding something really, really stressful I go the opposite way to other people. I tend to get really calm" 0068, Staff Nurse, Critical Care "But I don't like stress and I don't like worry or anxiety, so I very quickly recognise when I'm worrying or I'm anxious and will immediately do something about it." 0071, Sister, Critical Care "I think they probably go hand-in-hand. Your personality type and how you handle stress." 0079, Junior Doctor, Critical Care "I do, because we were all in a similar environment and people deal with it in different ways, and I don't know if personality and mindset are the same thing, I don't know, but the way I look at things, I'm like if I get stressed I can't do my job best that I could do it. So, I always try and make a conscious effort to keep myself calm and then I feel like I can do my own job better. So, I imagine it must be personality." 0048, Senior Staff Nurse, Critical Care "I get stressed. I just don't think about it. I tend to just deal with it, I don't necessarily overthink it, because it's part of life and you just have to overcome them, learn, and move on." 0055, Sister, Critical Care "I've never thought of myself as someone who gets particularly worried about stuff" 0034, Junior Doctor, Emergency Medicine

Leadership	Influence on leadership qualities	"So I think it was flexibility between leadership and teamwork. And we all seemed to click and understand each other's personalities really well in the team. But I think I did definitely see situations where there were a few really strong members who weren't the leader in the team, or wanted to have their views heard and almost take control a bit more. Which I think is really hard to then get the balance between taking control and then being a leader, so listening to other people's opinions, and actually understanding what everyone's role is." 0057, Physiotherapist, Critical Care "if you've got someone that's calm and like it's going to be fine, you're going to be okay, I'm here if you need anything just let me know, that tends to make them feel instantly relaxed for the shift." 0072, Sister, Critical Care "I think one aspect of it is confidence, and calmness, and certainty, and I think, if the leader provides that, I think that's good for a team because they feel reassured about the plans, in that we're going in the right direction." 0075, Physiotherapist, Critical Care "I've definitely seen examples of beneficial traits. Someone that can place themselves very easily in a position of leadership and authority. If you've got an emergency situation, you do need someone to take the lead and take people's first names. Ask them to do specific jobs. Put people into different roles. Lead the team. I think that's all very beneficial." 0079, Junior Doctor, Critical Care "Yes, I think enormously so. Some people internalise it. Some people are going to some people, feel it, and go back over it. Other people have a much more sort of instrumental approach to it, if you like. They say these are the problems I can solve. These are the things I can't solve, and I'm not going worry about the things that I can't solve" 0053, Consultant, Critical Care "I can see, in some of my senior colleagues, where their ability to accept something they can't change is much better than mine." 0077, Consultant, Critical Care "Some consultants are very laid-back and let… Which I find really motivating, that I can take over and run the department. And some consultants like to micromanage everything a registrar does and that creates more stress for a lot of people, actually" 0039, Junior Doctor, Emergency Department "I like to take people with my personality, the leadership style, I want to have control of everything" 0076, Junior Doctor, Emergency Department "I have a very collaborative way, that's my leadership style." 0087, Consultant, Critical Care

		"I've always had people, and trainees especially, coming to me and sharing what bothers them, even during pandemic. And I'm always very supportive of them, and I will do what I can to help them." 0087, Consultant, Critical Care "But I think I did definitely see situations where there were a few really strong members who weren't the leader in the team, or wanted to have their views heard and almost take control a bit more. Which I think is really hard to then get the balance between taking control and then being a leader, so listening to other people's opinions, and actually understanding what everyone's role is." 0057, Physiotherapist, Critical Care "I think one aspect of it is confidence, and calmness, and certainty, and I think, if the leader provides that, I think that's good for a team because they feel reassured about the plans, in that we're going in the right direction." 0075, Physiotherapist, Critical Care "Very dependent on the senior, really dependent on the senior. I think the most experienced consultants just got on with it. I think the most junior consultants were the ones who tended to be more stressed by it, and you could tell they were more stressed by it." 0034, Junior Doctor, Emergency Medicine
	Supporting different personalities within the team	"because you're such a big group of people you will get personalities that you not necessarily clash with, but you have to be a little bit more patient and diplomatic sometimes." 0080 Staff Nurse, Critical Care "Lots and lots of people take things home with them and stress out. I see a lot of people doing it and generally, you just need to remind them that they're seniors and their colleagues are qualified and the patients will still be safe if you go home, as long as you hand over." 0067, Junior Doctor, Critical Care "they need more support definitely….because they often feel that they're letting the team down, because they're quite slow, they don't see many patients. It's not their fault, but it's just how it is." 0035, Consultant, Emergency Department "I think that plays a big part in that, because you know when somebody's just a bit off or they're just not their normal selves. And I have known, that some people are more in tune to picking that up than other people are." 0060, Junior Doctor, Emergency Department "Or, rather than actually just trying to be empathetic and thinking… Why is this happening, and why is this person not doing the right thing? Or isn't doing what I think would be the right thing, and trying to understand why. And then work towards that person understanding it, and therefore doing it better." 0093, Senior Staff Nurse, Critical Care

Appendix 9. Supporting qualitative data relating to the negative consequences of psychological safety.

Theme	**Supporting Qualitative Data**
Impact on "Bandwidth"	"Yes. You can fill your bandwidth very quickly. It tends to be mainly clinical things and yes…" Consultant, Emergency Department, 0038 "Yes, I guess, maybe, for someone who's that bit higher up, you take all the concerns on, but sometimes, A, you don't know the answers, which is obviously very difficult, and B, there's not really anything you can really do about it, apart from try and reassure staff." Senior Physiotherapist, Critical Care, 0061 "I think where your bandwidth goes is where you're not high pressure. You're just running a floor. People are queueing up to ask you questions. They're not challenging. They're enquiring about what to do and I think that's when your bandwidth most goes. And I think that's when most of us feel pressure, feel stressed." Consultant, Emergency Medicine, 0069 "It's negative because they are distracted." Junior Doctor, Critical Care, 0070 "Yes I think so. There are definitely times when I'd get a bit frustrated. I suppose it's the do you mind if I come for a quick chat? And you're like yes of course come in, shut the door, and then it's an hour and you think I've got so much to do or I've got a meeting and I don't know how to end this conversation. And I think when people are a bit stressed and they'll talk about the same thing over and over because they're just trying to process it." Senior Nurse, Critical Care, 0072 "Oh no, that is draining me completely. A ten-hour shift going through, oh no, that's completely draining me, but I think it's part of the way that you can safely manage your department and make sure that the patients are safe and your team members are all right." Junior Doctor, Emergency Medicine, 0076 "because the ward round is taking so long because people keep interrupting you, someone else just gets fed up waiting for you to come round and they interrupt you and stuff. So, the interruptions are very distracting, rather than necessarily what they're interrupting you with, if you know what I mean. It's just the actual thought process being interrupted, regardless of the cause." Consultant, Critical Care, 0077 "I guess like if you're trying to get on with stuff it's probably quite annoying if people keep coming to you with concerns, for our doctors or for a nurse in charge, you know. I suppose that's the maybe concern it's saying. But then again for safety that kind of just." Junior Nurse, Critical Care, 0084 "it would be overwhelming at times." Junior Nurse, Critical Care, 0090 "It's tiring the more it happens, the later in the shift and the busier the shift, definitely." Consultant, Emergency Department 0052

	"Yes, because sometimes you don't know where you're going, what you're doing, up from down. But sometimes you'll find that there's a queue of people trying to get your attention and waiting for you to actually be able to either speak to you or show you something or have a discussion about something." Junior Doctor, Emergency Medicine, 0060 "in a high-pressure situation, you don't have time to explore that. So you need somebody to say, I'm concerned because blah, blah, blah. Not, it's really interesting you did that" Consultant, Emergency Medicine, 0069 "I suppose, in theory, you could have too many differing opinions being voiced about one thing" Junior Doctor, Emergency Medicine, 0078
Workload	"And you're like yes of course come in, shut the door, and then it's an hour and you think I've got so much to do or I've got a meeting and I don't know how to end this conversation." Senior Nurse, Critical Care, 0072 "I think there's got to be order and a time to do it. So, for instance, the ward round always has the potential to become this thing that goes on forever, loses its purpose." Physiotherapist, Critical Care, 0075 "You're doing a ward round where you've got 16 patients is, it's pretty tough to sustain and the more you invite contribution and discussion and debate, which is great from a patient point of view and an educational point of view, unfortunately the longer and longer the ward round gets." Consultant, Critical Care, 0092 "What is an issue is you do get interrupted all the time. So, if I'm on the computer ordering some tests for a patient or, and talking on the phone talking to radiology about a CT request, I will also have two or three people asking me questions at the same time." Consultant, Emergency Department, 0052 "It is. Because it can be overwhelming, you can't deal with everything, and if you consider management and if you have even 50 people and everyone comes with something, it becomes difficult to manage." Senior Nurse, Critical Care, 0055 "I could imagine it would mean that there's a delay in doing things because loads of people are raising concerns, perhaps unnecessarily, or just asking questions that are detracting from just getting on with seeing patients." Junior Doctor, Emergency Medicine, 0067 "I think the most stressful is dealing with a trainee who just cannot synthesise their thoughts into the challenge they've got. They can't say to you, I think this is X. Is that all right? Or even just say to you, I have no idea about this patient." Consultant, Emergency Department, 0069 "I realise that that is some of the reasoning behind why sometimes I don't get everything done in a day or doing stuff on my day off, like I'm doing today." Senior Nurse, Critical Care, 0071

Motivation to speak up	"But obtuseness is the most difficult because if somebody asks you a question and you're not sure why they're doing it, I think that's really hard." Consultant, Emergency Department, 0069 "To not get the blame for something that they might have otherwise done. To make it uninvolved or to make it [inaudible] if they were involved in something good" Junior Doctor, Emergency Department, 0073 "Those people that cause those problems are the sort of people that will never admit that they don't know, and that's part of the problem." Senior Nurse, Emergency Department, 0045 "Because sometimes when people speak out it might be vexatious or it doesn't actually contribute anything. It's not a particularly positive thing to say, i.e., gossip, for example." Consultant, Emergency Department, 0038 "Because there are some people that would complain all the time. And sometimes they don't question in the correct way, they come across as critical and that can have a negative effect on how the team works if someone looks like they're being cynical in your suggestions and things like that." Junior Nurse, Critical Care, 0048 "Some people exaggerate, but… Specially if they're seen as to just say anything" Senior Nurse, Critical Care, 0054 "Sometime the loudest people are not necessarily the most experienced or educated. Sometimes the loudest people are that way because they have no concept of the fact that they're not experienced or educated. As you bring an inexperienced medical team together with an inexperienced loud nursing team nobody's really doing. They're all just making suggestions and following each other without realising necessarily that nobody really knows what they're doing." Junior Nurse, Critical Care 0068 "I think is an ideal but I think it is a bit idealistic and I think it's unrealistic because somebody who's a junior Band 5 who's stressed out because they're not getting supported possibly doesn't understand the domino effect of what's happening up the house" Junior Nurse, Critical Care 0091
Affecting working relationships / Conflict	"I think it's great that we're all a bit more able to have dialogues with people, but I think it just makes things quite difficult sometimes." Consultant, Emergency Department 0036 "Conflicts in opinion but I don't think that's a bad thing to bounce ideas off each other." Physiotherapist, Critical Care, 0047

	"Because there are some people that would complain all the time. And sometimes they don't question in the correct way, they come across as critical and that can have a negative effect on how the team works if someone looks like they're being cynical in your suggestions and things like that." Junior Nurse, Critical Care, 0048 "I think if you do come out with something that potentially doesn't fit that mainstream narrative, being slightly left or right field it can result in a lot of eye rolling and potentially, no, that's just ridiculous." Senior Nurse, Critical Care, 0051 "I think there has been a few moments where something that is not perceived to be very important has come up. The only negative thing would be that the consultant would be like, why are we talking about this now? It's not important. Which I think is negative because it's probably not the right way to establish when things should be addressed and who they should be addressed to." Junior Doctor, Critical Care, 0070 "I don't know if I'm being a little extreme, but it just became a little lawless. Everyone was just like, I'm going to speak up and I'm going to say whatever I want and I will be heard." Junior Nurse, Emergency Medicine 0083 "You do get a little bit of bitching now and again, but I've noticed that that seems to be nursing in general now." Junior Nurse, Critical Care, 0086 "I don't think it's a lack of respect, but I don't know whether you just end up... I think we all respect each other. You can clearly respect your colleagues of the same level and you respect your juniors and you respect allied health professionals. But to some people I think that might be lost if you could just question everyone's decision" Junior Doctor, Critical Care, 0079 "I guess it's not the initial raising concerns, but I think sometimes people get stuck in their rabbit hole and almost go a bit head-to-head over something at work, in the workplace, maybe in a stressful situation. Which is inappropriate and probably both parties think they're right. I don't know what a specific example is." Junior Doctor, Emergency Medicine 0073
Coping Strategies	"That can be really difficult then if you've got lots of other things. So I suppose it's the art of delegation but, yes, I find that quite stressful" Consultant, Emergency Medicine, 0036 "You have to deflect sometimes. I often say to people just put it in an email because I'll forget what you told me. And just try and prioritise clinical concerns and questions for that particular shift" Consultant, Emergency Medicine, 0038 "If those things come up, then maybe reassurance or education or something else is the answer." Junior Doctor, Emergency Medicine 0039 "But those types of ideas would be shared either at handover or in the departmental meeting or come through another forum. Or, I think people are pretty disciplined about coming to you in the office or if the departments not that busy to say, I just wanted to run this by you, what do you think about this. But if the departments busy and there are physical queues and clues to that, there might be a queue of SHOs waiting to discuss with you, so people will automatically just go, yes that's an idea for another time I'll come back and have that conversation at a later date." Consultant, Emergency Medicine, 0052

	"But I've also learnt to delegate, so something that I don't think that needs my immediate attention, I would ask one of the junior guys to have a look at. But most times, there's a queue and everybody's waiting to speak to you, and everybody's wanting that attention." Junior Doctor, Emergency Medicine, 0060 "We should be saying to the trainees, only come when you've got a plan. Only come when you've got a question. So I just say to them all, rather than just tell me a hundred facts about this patient, tell me what the question is you want me to answer and then tell me the information because otherwise I have no idea." Consultant, Emergency Medicine, 0069 "I think maybe although it's important the consultant is present and involved, that's something that the registrar can deal with. Not to be interrupted on the ward round." 0070 "I think it's doing it at the right time. I think there's got to be order and a time to do it." 0075 "I think it's getting that tension or that balance between having enough of a horizontal hierarchy that everyone feels able to raise the concerns they have, so that issues of patient safety or barriers to their progress can be addressed in a timely way. But, still maintaining, maybe, enough of that vertical hierarchy that people ask them questions in the right way at the right time." 0075 "I will just prioritise what needs to be sorted first and then just go one by one and then advise them what needs to be done" 0090 "I think the useful thing maybe is groups or meetings to discuss and trying to solve at least the most-occurring issues." 0055 "I think we're quite good at discipline of that sort of thing and most of us have developed a process whereby, in a high-pressure situation, every so often we'll say, right, anybody got any questions. Have I forgotten anything, so that you can check in with the team." 0069 "but particularly if it maybe goes off on tracks that are not relevant, or whatever, and then you maybe need to stop it a bit" 0093

Appendix 10. Qualitative data supporting the thematic framework for the Impact of COVID-19 on frontline healthcare workers.

THEME	SUBTHEMES	SUPPORTING QUOTATIONS
PSYCHOLOGICAL EFFECTS	**Presence of psychological distress**	"I think everyone's quite bad now. I think everyone wants to be furloughed, basically." Senior Sister, Emergency Department, July 2020 "So, none of us have really had a breather" Senior Sister, Emergency Department, July 2020 "So I really struggled coming out of the peak I think and going back to normal work and trying to live normal life I found really difficult. And I had nightmares and stuff for quite a long time. I've only just stopped really." Physiotherapist, Critical Care, July 2020 "All these really horrible dark vivid dreams, and I think just because I would think about people and worry about patients once they're home." Physiotherapist, Critical Care, July 2020 "I felt mental exhaustion. That was the difference." Senior Sister, Critical Care, July 2020 "And I could see that was very much a grieving process going on" Senior Sister, Critical Care, July 2020 "there was a lot of staff burnout and staff stress" Senior Physiotherapist, Critical Care, July 2020 "Everyone was so negative and people were going for their break and just cry. I did that many times. It was just too much stress." Staff Nurse, Critical Care, August 2020 "I think the COVID has left everybody a little bit PTSD angry where they don't really know what they're angry about. They're on edge. They've gone into that fear response. It was sustained for those three months and it's been harder to get out of it, if that makes sense. I've seen that across the floor." Staff Nurse, Critical Care, August 2020 "There were people who were really stressed. Although without knowing it they were fantastic at not showing it." Senior Sister, Critical Care, September 2020 "I'd get home and be so utterly exhausted that I'd feel like I had nothing left, just so drained emotionally and physically." Senior Sister, Critical Care, September 2020

		"We have all started seeing things a bit different I think on a personal level, professional level, but it's the constant stress of that from the mask that we need to wear all the time" Registrar, Emergency Medicine, September 2020 "And of course all of us, and regardless of professional role, are still trying to pick themselves up after. So it's just different types of stress. There's some stress you don't mind and there's some stress that is just, like, this is crazy." Staff Nurse, Critical Care, October 2020 "Some people are just not ready to talk about it. They're just not ready to talk about it. And I was originally one of those people, because it was just such a hard time. It was such, such, such a hard time. And I just don't think people can always comprehend it. Sometimes it feels like you're still there even though it's a few months after." Staff Nurse, Critical Care, October 2020 "So, yes, it's persistent. Some people they're like, I'm still living it. I was speaking to my colleague yesterday. We were speaking about it. She was actually crying. It really brought home to me again how turbulent the pandemic was for intensive care." Staff Nurse, Critical Care , October 2020 "my mood did go down quite a bit" Staff Nurse, Critical Care, October 2020 "I think morale is really low. The empathy is going, patience has gone a long time ago, people just don't have... Yes, I think people are just exhausted and they just want to come in, do their work and leave and go home." Senior Staff Nurse, Critical Care, November 2020 "But a lot of people are just exhausted after the pandemic. The way that things are still at the moment, the conditions that they're expected to work under, people have just had enough so they're leaving." Senior Staff Nurse, Critical Care, November 2020 "I just feel like, it was a bad dream at the moment." Senior Staff Nurse, Critical Care, November 2020 "but they're just burnt out. They're on the floor, they're just exhausted." Senior Staff Nurse, Critical Care, November 2020 "Normally in a shift, one or two people might be stressed at any one point in time but it's an unusual thing for everybody to have a heightened thing, maybe in the depths of winter or in a major incident. But it's not something on an ongoing basis where everybody's anxieties is elevated." Consultant, Emergency Medicine, July 2020

		"Normally, it's quite a bubbly, chatty team and people were just like unbelievably negative. Everyone was so negative and people were going for their break and just cry. I did that many times. It was just too much stress." Staff Nurse, Critical Care, August 2020 "They brought a psychologist to come and speak to us and then everybody would just speak to him and cry. It was just really negative. People would talk to each other but it was just like, oh I hate this. When is it going to end? I can't deal with this. It wouldn't be a normal conversation that we would normally have." Staff Nurse, Critical Care, October 2020 "I think I need a little bit more TLC, and I got a little bit more help." Staff Nurse, Critical Care, October 2020 "I found it stressful. I think I learned to manage. And I found that during the COVID, it was very different, so it came, a side of me that I did not know before. But because I'm aware of it, I raised it straightaway, so I knew that I had to get certain help with something or discuss things as they were going along, because it just helped me out. I felt mental exhaustion. That was the difference." Senior Sister, Critical Care, July 2020 "So, all these things will happen, and then one small thing at the end will happen, and then I will just be really upset. And, look, that happened a couple of times to me, which had never happened to me at work before. So, I did have a couple of situations." Staff Nurse, Critical Care, July 2020 "During COVID it was absolute chaos. That would just increase my stress levels another level. I couldn't even find a 10ml syringe." Staff Nurse, Critical Care, August 2020 "Because I got put up in accommodation near the hospital, so it was being away from your family, you friends. And yes, my mood did go down quite a bit" Staff Nurse, Critical Care, October 2020 " I was on the verge of I can't handle it I need to go, and then the next minute it was just bang straight back into automatic pilot. It's so strange." Senior Sister, Critical Care, September 2020 "Absolutely, yes. Tiring, burnout and completely mentally devastated" Staff Nurse, Critical Care, July 2020 "I think I found it hugely stressful." Physiotherapist, Critical Care, September 2020 "So, I found that when I wasn't at work, actually was much more stressed and anxious. Because when I was at work I felt like I can control, I could make a difference, I could do something." Senior Sister, Critical Care, July 2020 "I didn't personally find it an enjoyable experience at all. I found it awful" Consultant, Critical Care, July 2020

		"I know everyone in ITU is anyway, but on my first day, the numbers, I had three level 3s on quad strength Norad, all proned, and I just sat there crying, drawing up my Fentanyl." Staff Nurse, Critical Care, October 2020 "And I think it was a bit quiet among all of us. I don't know. It wasn't how we normally would be in the break rooms and things like that." Staff Nurse, Critical Care, July 2020 "probably the thing that struck me the most, was appreciating the increased stress in my colleagues, so across our staff, team. So, nursing staff as well as doctors, and their anxieties being more prevalent and just globally up." Consultant, Emergency Medicine, July 2020 "But we didn't know in the beginning. I think that was the heaviest burden." Staff Nurse, Critical Care, July 2020
	Fear of COVID-19	"And I think that the pandemic meant everyone is going through their own problems related to knock-on effects of the pandemic." Staff Nurse, Emergency Department, October 2020 "Fear of getting COVID and is the PPE that we're using right" Consultant, Emergency Medicine, July 2020 "it was very much felt that the people who were going in could potentially be in harm's way" Senior Sister, Critical Care, July 2020 "And I was very aware of the idea that I was in an office round the back, and was not. I think, on reflection now, there were hundreds of us in this little tiny area. We were not socially distanced at all. Actually, we were all in a certain amount of danger and had a certain amount of risk." Senior Sister, Critical Care, July 2020 "There was a bit of personal stress because you didn't want to catch it or give it to your loved ones, but you could take steps to manage that." Consultant, Emergency Department, July 2020 "So, I think things that made it more stressful were, often, on intensive care, perhaps a protective mechanism, you can rationalise why you are not going to be in that critically ill situation. As in, I don't know, I don't smoke or I'm not old enough to have the disease you're in with or whatever. Yet, although it was biased towards a certain population group, there was still a lot of doubt how at risk we were." Physiotherapist, Critical Care, September 2020 "I think that you saw the bosses visibly shaken by it and ITU consultants, who obviously are hugely experienced, visibly shaken and anxious about it." Physiotherapist, Critical Care, September 2020 "One of them said to me, have you heard so-and-so's been admitted to A&E? Or I'd be in a safety briefing. Have you heard these people in their 30s are on non-rebreather bags in A&E? So, I think those things really stirred it up to a whole new level." Physiotherapist, Critical Care, September 2020

		"I think when we were being redeployed from the wards we were being moved to other wards initially and I felt kind of safer in ICU than I did on the wards. Because even though you're in full PPE and it's stressful, but I felt I had more peace of mind working there as such." Staff Nurse, Critical Care, October 2020 "And coronavirus itself was stressful." Staff Nurse, Critical Care, October 2020 "everybody seemed to be aware that we were all vulnerable, we could fall ill, for example" Consultant, Critical Care, December 2020 "And obviously with Covid and lots of other personal things, it is interesting how people bring that to work, and even though she was seeing people, she couldn't, she didn't have the bandwidth to do her normal job role as a registrar." Registrar, Emergency Medicine, July 2020 "And handling pressures and concerns for their loved ones at home whether that's here, elsewhere." Consultant, Emergency Medicine, July 2020 "like I say, we have a number of Filipino nurses whose family are at home and they're worried about them, they haven't been, can't go, all of that side of things." Consultant, Emergency Medicine, July 2020 "There was a bit of personal stress because you didn't want to catch it or give it to your loved ones, but you could take steps to manage that." Consultant, Emergency Department, August 2020
	Feelings of isolation	"Honestly, what it felt like was A&E versus the world." Senior Sister, Emergency Department, July 2020 "ITU were just not coming. We were calling and calling. They were just not coming. The Regis and consultants in the A&E were basically like, there's nothing we can do." Senior Sister, Emergency Department, July 2020 "I think the nurses got closer. And it's probably more of a nurse doctor division. But then there is more now of an A&E versus the rest of the world division. In the middle of Covid, it literally felt like A&E was the only place dealing with it. Because ITU just weren't interested in coming down. The wards were closed to Covid. So, the wards, they were closed. They weren't taking patients. We weren't doing an IV. So, we weren't doing half the treatment that we'd normally do for these patients." Senior Sister, Emergency Department, July 2020 "Secondly, I didn't see my family. I didn't see my friends. I did not see anyone. I just worked. I saw my work friends, obviously. And I'm very grateful that I was able to leave the house and do that." Senior Sister, Emergency Department, July 2020

		"Sometimes you're in a room on your own and sometimes you're in a bay. When it started, you were in your room and you could be in there for four or five hours, because there weren't people to come and relieve you. But then as it started to get worse, in a way it got better. Because we went into recovery and that was so open that if you needed a hand or if you needed a break, there was somebody who would just watch your patient for five minutes." Staff Nurse, Critical Care, October 2020 "When we were still upstairs, you were just stuck basically. Even if you needed some help, you would have to wait." Staff Nurse, Critical Care, October 2020 "Ten minutes, because they didn't hear it. We were quite stuck on one side, and nobody on the other side came round because it was mid breaks on night shift. Nobody came, yes, not good. What else?" Staff Nurse, Critical Care, October 2020 "And she felt, there's no point in me being here. And she was vocalising this in front of lots of people, and said, there's no point of me being here. This is useless. Why am I here?" Senior Sister, Critical Care, July 2020
	Indicators of moral injury	"it doesn't work every day, some days it just doesn't work. So we are trying but I find... I often finish the end of my week thinking, I just failed here, I really failed to create a good team spirit and making, feeling like I've had enough time at the bed space with the patients and with the nurses." Consultant, Critical Care, November 2020 "I mean whether or not that was the right thing to do, I don't know. But we had to do something" Senior Sister, Emergency Department, July 2020 "We looked after her, really, to the best of our ability. But it was just awful. Those decisions. And maybe there was more to it than that. But it didn't feel at the time like there was more to it." Senior Sister, Emergency Department, July 2020 "Was that people were making really horrible choices. And to me, they didn't always feel that they were based ethically. But, then again, nothing was ideal. Never, ever, ever have to make those choices." Senior Sister, Emergency Department, July 2020 "We did absolutely the best that we could possibly do, but it just in no way, shape or form was good enough. But we did what we could in the confines of our environment" Senior Sister, Emergency Department, July 2020 "people were doing what they could do and recognised that there were going to be things that just couldn't be done." Senior Sister, Critical Care, July 2020

		"But then you're also like if you're not going to don are you giving the same care that you normally did?" Senior Staff Nurse, Critical Care, July 2020 "It was just nuts, and you can't do it. You can't, even when they've all got the same disease. You can't do it safely, much less anything with anything else." Consultant, Critical Care, July 2020 " I think there's the sense that things were slightly out of control, and we were treating a disease we didn't understand." Consultant, Critical Care, July 2020 "And the fact that you couldn't give individualised care" Senior Staff Nurse, Critical Care, July 2020 "I think when everything was at its peak, I don't know, everyone just felt very out of their depth." Staff Nurse, Critical Care, July 2020 "even if we don't really agree with it or see eye to eye, that's what the powers that be have in place, we just have to go with it, for the bigger picture." Registrar, Emergency Medicine, July 2020 "Actually, we don't have this foresight, we don't have that extra vision, and we're now making decisions and we're using our best clinical judgement at this point "Registrar, Emergency Medicine, July 2020 "Because it was so clear that we were all in exactly the same boat, having exactly the same feelings. Are we doing the right thing? Should we be doing more? What do we do now? Where do go for help or are we asking for too much help?" Physiotherapist, Critical Care, July 2020 "I was like, oh my god, this is actually a disaster. I hate my life. I don't want to do this anymore." Staff Nurse, Critical Care, August 2020 "There were days I didn't even turn my patient once. That's awful. That was disgusting. We all just thought if each of these patients could have one to one care, they would probably do a lot better than they would cohorted and not looked after in the proper way." Staff Nurse, Critical Care, August 2020 "Everyone felt like they weren't looking after their patients properly. We weren't." Staff Nurse, Critical Care, August 2020 "But I think it was the lack of being able to do anything." Junior Doctor, Emergency Department, August 2020

		"And so a lot of care I think got missed, a lot of generally, the monitoring that we usually do got missed. We had a lot more unexpected arrests" Staff Nurse, Critical Care, August 2020 "I was completely lost as to what to do." Senior Staff Nurse, Critical Care, October 2020 "but each week I come away feeling I failed again, so it's hard," Staff Nurse, Critical Care, July 2020 "I think difficulty with Covid was probably less that people didn't know, but more that very, very difficult decisions had to be made." Senior Sister, Emergency Department, July 2020 "And then when ITU eventually did come, it was a very horrible, actually, conversation about which patient do you actually take into ITU." Senior Sister, Emergency Department, July 2020 "but there were some things that I couldn't change." Senior Sister, Critical Care, September 2020 "And I have two particular shifts that come to mind where all day, as long as I left and they were still breathing, that was the only thing I wanted." Senior Staff Nurse, Critical Care, October 2020 "So when it first hit… I've not really reflected on this, so it's a bit difficult, but about [inaudible]. But I think it was the lack of being able to do anything. People turned up with sats of 50." Junior Doctor, Emergency Department, August 2020 "I don't know, each shift I felt like oh, I don't know what I'm doing. And when you feel like you don't know what you're doing, you feel more stress" Senior Staff Nurse, Critical Care, July 2020 "And the fact that you couldn't give individualised care, because you had two Level 3s, and you're just jumping left, right and centre. And you might get mixed up with things, so situations have been like, someone is so stressed, they roll the patient, the patient is extubated accidentally. That happened during the COVID time." Senior Staff Nurse, Critical Care, July 2020 "Yes, it was just too much to deal with. Normally, I work like, my last gas was at six, I will do one at eight. I'm very almost anal about things. Everything was a mess during COVID and I was like, I can't even work in this mess. It was increasing the stress. I've already got two or three patients and I can't even work in the space." Staff Nurse, Critical Care, August 2020 "I definitely remember a day when I was in one of the bays and there was just a lot going on. And then I felt incredibly overwhelmed and I just remember wanting to get out of there as soon as possible. I was there to relieve everybody else." Senior Sister, Critical Care, September 2020

		"And obviously we were looking after more than one patient... I know when you've got a Level 3 intubated and that, it should be one to one, but we were having three to one at one point." Staff Nurse, Critical Care, October 2020 "So I think sometimes it's a double-edged sword, knowing what practice was before and the standard of practice before, and then of course, working through and adapting practice during" Staff Nurse, Critical Care, October 2020
	Related to supporting others in their own psychological distress	"They probably needed a proper psychologist or some form of counselling professionally" Senior Sister, Critical Care, September 2020 "I think it did change. I think we became a much more of an emotional support. Probably, although technically yes, we were there, but I think emotionally we were supporting people with a lot of… Trying to relax and debrief them, let them talk about stuff to us as opposed to clinically trying to solve their problems." Senior Sister, Critical Care, July 2020 "So, I think it was important, and then, I think, then that gave them the time to open up, when maybe they didn't feel like they could or because we were so busy, and as such in crisis mode, that it gave them the opportunity that they could speak up" Senior Physiotherapist, Critical Care, July 2020 "And I was becoming increasingly stressed and anxious and worried about all the staff that were clearly worried about getting COVID themselves, or their families. Or they've had to move into a hotel and can't see their children, those kinds of concerns as well as work." Senior Sister, Critical Care, September 2020 "I think everyone's carrying that around with them, and it just calls for a little bit more empathy when somebody snaps at you or something." Staff Nurse, Emergency Department, October 2020 "I suppose the only thing that I found during the pandemic is because I'm in that role anyway, and I offer a lot of pastoral support and stuff, I felt that I was taking a lot of it on as well." Senior Sister, Critical Care, September 2020 "So, I guess that is sometimes difficult, you obviously had to listen to people, and we were very worried about staff burnout and staff stress, but we really did still have so much work we had to do, with much more spread out staff than what we usually would have." Senior Physiotherapist, Critical Care, July 2020 "I don't think I particularly had a huge amount until COVID came along and there was this, yes, and then everything changed. But that was still, the stress that I felt was very much a stress of other peoples, taking on their worries and trying to support them." Senior Sister, Critical Care, July 2020

	As a function of the "unknown" nature of a pandemic	" but I think that was true for everyone that was there or that was redeployed or that was existing staff because I think it was just so… Everyone uses that word, unprecedented and I kind of hate that word now but it was so new, wasn't it?" Physiotherapist, Critical Care, July 2020 "I think there was an element of stress because we were dealing with something new." Consultant, Emergency Department, August 2020 "I think it was, most of all, not knowing what was happening, not knowing how to make a patient better." Staff Nurse, Critical Care, July 2020 "I guess it was just not knowing exactly what the problem is. We all knew that, okay, there's coronavirus." Staff Nurse, Critical Care, October 2020 "I noticed, some of my colleagues had so many difficulties just dealing with the new things" Staff Nurse, Critical Care, July 2020 "Where sometimes you felt decisions were made a bit later because everyone was unsure on how to look after these patients." Senior Staff Nurse, Critical Care, July 2020 "Managers tried to implement things, but they didn't really help, because it was unknown to everyone, what was going on." Staff Nurse, Critical Care, July 2020 "We didn't really know what was going to happen either. I think it was difficult and stressful for everyone." Senior Sister, Critical Care, July 2020 "We were handling a disease which we were not familiar with, and lots of things were different." Consultant, Critical Care, October 2020 "I think it was obviously in keeping with everyone's behaviour changing because we were all a bit like, this is new, for absolutely everyone here. No one's really experienced anything like this before." Physiotherapist, Critical Care, July 2020 "But in a way, that was also very liberating because you couldn't be expected to know what to do because nobody did, because it was evolving. And therefore, in a way, it was less stressful than sometimes…" Consultant, Emergency Department, August 2020

		"I think before, because no one really knew what was coming, so you just had that mentality of, it's coming, we just get on with it, we just cope as best we can" Senior Staff Nurse, Critical Care, November 2020
	Evidence of coping strategies	"sometimes you can go into the staffroom, it might be quiet, but during COVID it was always busy, loud, real positive environment. And we were all conscious of keeping each other's morale up." Senior Staff Nurse, Critical Care, July 2020 "And it's just all I did. Just went to work and I just did it. That's just pandemic response. Just go for it. And then, eventually, it would be finished." Senior Sister, Emergency Department, July 2020 "We adapted to whatever came so it was madness because there was no control about anything." Staff Nurse, Critical Care, July 2020 "I think in a sense, going through the pandemic and seeing that absolutely everyone is sometimes, in the same boat." Physiotherapist, Critical Care, July 2020 "So if the physio can't treat it, that's then my job and then I take a step back, and then it's not necessarily my responsibility to make the ultimate decision for the patient." Physiotherapist, Critical Care, July 2020 "Yes, I think now, I'm much more content in the knowledge that I'm good at my job and I'm doing okay and if you do something that's not right, you'll know about it" Physiotherapist, Critical Care, July 2020 "I knew that at some point it finishes. And that got me through and kept me quite calm through it. I was very calm through it." Senior Sister, Emergency Department, July 2020 "I can't control this, this isn't what I would have chosen, but then what can I control? I can control deciding to make this work." Staff Nurse, Critical Care, July 2020 "I think I went in with the idea that there were certain things I simply cannot control, and there's no point in my becoming upset about things that I can't control. That's an aspect of my character, which I think I'm sometimes grateful for, and sometimes ashamed of, that I will just accept what's happening and get on." Senior Sister, Critical Care, July 2020 "You are sweating, your face is hurting. I think as well because I've been clinical and in charge on the ward and stuff. So, I think that experience did help me with organising and saying you need to do this." Staff Nurse, Critical Care, August 2020 "It's always nice to be able to just smile. I tried as much as possible to insert a smile and just keep people going as much as we could, as did thousands literally." Staff Nurse, Critical Care, October 2020 "maybe a little bit of displacement activity, or mentioning how in their day things were different" Senior Sister, Critical Care, July 2020

		"So, where we would do a handover every day being really clear about what… Because PPE, different areas of department, our layout, things were changing constantly, it was the need to be myself up to speed, make sure that the top of the day, top of shift brief was done well." Consultant, Emergency Medicine, July 2020
	Influence of personality on psychological distress caused by COVID-19	"And there were times when I'd probably snap or I'd hurry people on and say actually no I don't have time for this, I'll speak to you later on or whatever. And that's just not how I normally would communicate with people, and I'd notice that I was getting stressed at that stage." Senior Sister, Critical Care, September 2020 "So those are few people that were noticeably very stressed, and then other people would get stressed around them. And normally I'm the opposite and it's okay, but there were parts when I'd get a bit like that." Senior Sister, Critical Care, September 2020 "I was very calm through it" Senior Sister, Critical Care , July 2020 "I spent a lot of time waiting and that really stressed me out I found, because I just felt out of control" Physiotherapist, Critical Care, July 2020 "it was just too much to deal with. Normally, I work like, my last gas was at six, I will do one at eight. I'm very almost anal about things. Everything was a mess during COVID and I was like, I can't even work in this mess. It was increasing the stress. I've already got two or three patients and I can't even work in the space." Staff Nurse, Critical Care, September 2020 "I think different people responded differently. And I think again, stress really changed that" Staff Nurse, Emergency Department, September 2020 "I think having other personalities that weren't ITU nurses in the mix probably helped as well." Senior Sister, Critical Care, July 2020 "I would say definitely, yes. I think probably that environment I think while people were stressed I think they just kind of got on with it kind of thing" Staff Nurse, Critical Care, October 2020 "I think so. I think because I've noticed with my colleagues, all of us have reacted in different ways. I get stressed. I did have moments when I was very stressed." Staff Nurse, Critical Care, July 2020

	End of first wave and return to "normal"	"I was so sad when actually we had to split up and go back to our normal jobs." Physiotherapist, Critical Care, July 2020 "many people, at least the ones that I've spoken with since then, found themselves really exhausted after the pandemic started slowing down." Senior Sister, Critical Care, July 2020 "Everything came with a boom and left with a boom. All of a sudden, you got used to this, it's going to be extremely busy, and you got used to the impact of it, and you're just left with nothing happened." Senior Sister, Critical Care, July 2020 "Yes, it has, and it's nice. Everyone's definitely happier at the moment" Senior Sister, Critical Care, July 2020 "Now the problem with that is that I think people were just pushing back a lot of the negative feelings and a lot of the stress that they were actually feeling at the time" Senior Sister, Critical Care, September 2020 "I feel a bit strange saying this, but I have mentioned it to a few people, I miss COVID a bit" Staff Nurse, Critical Care, October 2020 "Afterwards, it hit you like a tonne of bricks after, especially even after a shift sometimes. When you're in it, you're in it. You don't have the time to reflect on how you're feeling. But afterwards, you're like, whoa." Staff Nurse, Critical Care, October 2020 "People that you see around and got to know during that time it was still really nice and felt more similar but it has definitely faded off. Towards the end it's kind of tailed off and people just get used to the new norm which is weird" Physiotherapist, Critical Care, July 2020 "I think less so now, actually. I haven't quite put my finger on it yet but there's something about the pandemic which has changed the way that I think about work now" Physiotherapist, Critical Care, July 2020 "It's a very different kind of stress. It's not stress where you cannot manage everything. It's stress where you're like, oh my gosh, I have to suffer through another six hours of doing very little, because there's nothing to do. There's nothing to occupy myself with. Where are the patients? Or, I don't really like this person that I'm working with, and I have to small talk with them for the next six hours because there's no patients." Staff Nurse, Emergency Department, October 2020 "It's just been a hard time. As I say, more so now. Like, we're really getting back into the, you are not a COVID-19 robot, and now we're getting back into, oh yeah, you're [name]. We know each other now." Staff Nurse, Critical Care, October 2020

		" I think it'll eventually go back to business as usual when we have new personnel and it all just… And you don't have that common ground anymore with new people so it's very difficult to build those relationships in that way again." Staff Nurse, Critical Care, September 2020
CHANGES IN TEAM DYNAMICS	**Flattening of hierarchy, or changes in presence of hierarchy**	"It's always been pretty easy, but the fact that nobody knew much about it, surely flattened the differences between the senior staff and the junior staff." Staff Nurse, Critical Care, July 2020 "Because no one knew what they were doing." Senior Staff Nurse, Critical Care, July 2020 "So, you just ask, which was nice to be able to have a more level field on that kind of thing." Senior Staff Nurse, Critical Care, July 2020 "Do I think it got flattened a bit? Not in a good way. It might have done but only because… I think the effect of it, to be honest, was probably that we were simply less able to provide the things that people do rely on us for and that they want the hierarchical relationship most of the time. They wanted to be able to dump stuff on us" Consultant, Critical Care, July 2020 "So no, I don't think it did flatten it, really, and certainly not in a way that helped anything. I there's a slight sense that this was a different time, and it was a bit of [unclear]. I think that did flatten the hierarchy a little, and that was in a good way." Consultant, Critical Care, July 2020 "Maybe slightly flattened but not so much. I think the only reason why it flattened is we had people from different teams joining us, and they were already at their respected stages, so maybe that's why it flattened" Senior Sister, Critical Care, July 2020 "I think that, yes, there definitely was on the ground quite a flattening and a flattening between professions" Staff Nurse, Critical Care, July 2020 "I think it was the same, to be honest, because the consultant, it didn't really differ, because all of the patients were the same. So, all the treatment that all the patients were having was the same treatment. There wouldn't be a difference in the leadership of that patient." Staff Nurse, Critical Care, July 2020 "Yes, I think it probably did, and I think, because where you had, maybe, people that were in a position of authority if you compare, like they were consultants, but they weren't necessarily consultants that were specialists in critical care, they might have been more anaesthetic consultants. In that respect, I think, it was nice to recognise that, yes, you're not medical, but actually, maybe, you do know a bit more about the day-to-day management of an ITU patient." Senior Physiotherapist, Critical Care, July 2020

		"So, I think in that case, it probably did, and I think everybody, regardless of their banding and their grade, were happy to do whatever. So, I think it probably did flatten from that point of view, yes." Senior Physiotherapist, Critical Care, July 2020 "I think they were really open to chatting to us. Especially the physios, I noticed. Whereas they can be a little bit dismissive of our weaning plans or treatment plans or something like that, but I did notice that, during that pandemic, they were very much like what do you guys think?" Physiotherapist, Critical Care, July 2020 "Yes, there was no hierarchy during COVID I don't think" Staff Nurse, Critical Care, August 2020 "I think it's probably changed for the better. I don't know if it will stay that way. But certainly during the pandemic or during the surge, if you like, there was definitely less of a hierarchy in terms of patient care and priorities than there would be on a normal day." Staff Nurse, Emergency Department, August 2020 "I think it was very flat in COVID" Consultant, Emergency Department, August 2020 "There was an opportunity each day for consultation about management plans and how to look after someone. So, there was a mixture of a slight flattening, but also a quite nice system where one of the consultants would come down and basically sit through a handover. That would be a time for the incoming consultant or whoever to ask." Junior Doctor, Critical Care, September 2020
	Morale and camaraderie	"But I saw at first-hand what was going on and it was brilliant, they were working more than a team, we were like a family and people just got on with it." Senior Sister, Critical Care, September 2020 "I think the relationships, generally, was very good. I think, maybe, it's heightened it, if anything, and I think the camaraderie was amazing, between the MDT." Senior Physiotherapist, Critical Care, July 2020 "I think morale is really low" Senior Staff Nurse, Critical Care, November 2020 "Suddenly, there was an enormous amount of goodwill." Consultant, Critical Care, December 2020 "it's something that particularly came to light I think during COVID, how supportive people are of one another." Senior Sister, Critical Care, July 2020 "So I'm grateful to have been in a supportive team because I think it would have been a big struggle otherwise." Physiotherapist, Critical Care, July 2020

		"And that was incredibly impressive and quite moving on occasion" Consultant, Critical Care, July 2020 "I think everyone really stepped up and I think we really just acted as one team. It didn't really matter what your role was, it didn't matter who you were, what your experience was, everyone was just there to help. So, I think that was something that's really nice, I think" Senior Physiotherapist, Critical Care, July 2020 "looking back on it, it was a great team to work in and I wouldn't have changed it for anything." Physiotherapist, Critical Care, July 2020 "But I think generally as a team they kind of pulled together pretty well." Staff Nurse, Critical Care, October 2020 "It was horrendous and we had to wear level three PPE all day, but everyone was in it together." Senior Staff Nurse, Critical Care, October 2020 "I would say for the pre and post, what I noticed in my team is that the immediate stress was fine, actually, and pretty easy… Not easy to handle but quite bonding and energetic," Staff Nurse, Critical Care "said it was one of the most enjoyable times that they've had at work because of the atmosphere, the camaraderie, that can-do, let's fix it, let's stand together aspects of it. And that was incredibly impressive and quite moving on occasion, but there were significant downsides to COVID." Consultant, Critical Care, July 2020 "I think the nurses got closer." Senior Sister, Emergency Department, July 2020 "it's something that particularly came to light I think during COVID, how supportive people are of one another." Senior Sister, Critical Care, July 2020 "I became so much closer with loads of the doctors, the nurses. Whereas usually, people are kind of friends, but less so to the extent that it was during COVID. It was really great, it felt like a little family and I enjoyed coming in to work" Physiotherapist, Critical Care, July 2020 "That was pretty different and there were loads of people that I'd never met before but I think just because you spend so much time with them, yes we became so close." Physiotherapist, Critical Care, July 2020 "Especially that was exaggerated during COVID, because when things got difficult, if anything, we got more supportive as a team. And especially outside of the clinical area." Senior Staff Nurse, Critical Care, July 2020

		"Right, great, loads of people have come to help, that's amazing, let's all crack on together. So, I think that potentially helped" Senior Sister, Critical Care, July 2020 "everyone made extra effort to help people around them." Senior Sister, Critical Care, July 2020 " If they were in PPE for six hours at a time you'd be like, okay I'll watch your patient while you go on a half an hour break, it's not a big deal." Physiotherapist, Critical Care, July 2020 "I think, maybe, it's heightened it, if anything, and I think the camaraderie was amazing, between the MDT" Senior Physiotherapist, Critical Care, July 2020 "I think everyone really stepped up and I think we really just acted as one team. It didn't really matter what your role was, it didn't matter who you were, what your experience was, everyone was just there to help. So, I think that was something that's really nice, I think." Senior Physiotherapist, Critical Care, July 2020 "My experience was that everyone was really in it together." Senior Physiotherapist, Critical Care, July 2020 "Yes, and I think because we had been together for three or four months longer than we would have been, we'd got over that part of getting to know each other and we were actually just really good friends. It was everyone was just quite candid with each other, and real. Yes." Physiotherapist, Critical Care, July 2020 "I think the camaraderie was amazing. It was nothing I've ever experienced before." Physiotherapist, Critical Care, July 2020 "I don't think so because as we said, everybody had that comradeship, so people were quite willing to welcome me into that comrade point of view, from that perspective." Junior Doctor, Critical Care, September 2020 "when it's stressful because of the circumstances that is when people just sort of roll up their sleeves and just get on with it and that's actually quite good in terms of the comradery and whatever" Staff Nurse, Critical Care, October 2020 "In that we did all just pitch in." Staff Nurse, Critical Care, October 2020 "But the team, yes, there was like a good feeling of working together during COVID, for, you know, we're all in this shit together kind of thing." Staff Nurse, Critical Care, October 2020 "But I mean, everyone just pulled together and we made it in the end." Staff Nurse, Critical Care, October 2020

		"People were talking constantly, and there was a lot of communication, there was a lot of banter. Everyone seemed to be in really good spirits. Which was bizarre, but it was a really great time." Senior Staff Nurse, Critical Care, November 2020 "but everyone was in it together. Everyone checked in, everyone was helping everyone else out" Senior Staff Nurse, Critical Care, November 2020 "Covid is very much for our team has really brought us together" Senior Sister, Emergency Department, July 2020 "My opinion is that the whole thing was run really, really well and it was a really difficult situation, but everybody put their best foot forward. I would say perhaps people stacked up even more." Junior Doctor, Critical Care, August 2020
	Changes in relationships & breaking down barriers Influenced by having COVID-19 as a shared experience	"I became definitely closer with the consultants through COVID than I did before." Senior Sister, Critical Care, July 2020 "But then, at the same time, a lot of the doctors had come in, and we had to get doctors to cover ITU nurses and things like that for breaks, because there just wasn't any cover. So, by the end of it, I think they realised that we really needed the help." Staff Nurse, Critical Care, July 2020 "Has that affected the teamworking? No, it hasn't because nurses have a vast respect for the doctors and I think the doctors have a vast respect for nurses. Perhaps they respect them more now because they know nurses are in there just figuring it out by themselves and trying their best." Senior Staff Nurse, Critical Care, November 2020 "But I would imagine more experienced senior nurses in intensive care, I would imagine the doctors have more respect for them now because they carry more weight and they're really supporting the juniors" Senior Staff Nurse, Critical Care, November 2020 "Some of them, I really, especially in the midst of PPE, no badges, I really didn't know they were Band 8s. And we worked hand in hand together, fine." Staff Nurse, Critical Care, October 2020 "And then going, that's because they were on the same [unclear], and so I think some quite close relationships were formed. And it's helped clinical care, subsequently, as well. It's much easier to get a sensible surgical opinion " Consultant, Critical Care, July 2020 "And so I think it also then made them more aware of what we do as physios as well. So then it was the feedback across working which was really amplified in that environment, more so than I felt before." Physiotherapist, Critical Care, July 2020

		"a lot of the doctors would go in and relieve the nurses for their breaks. So when they were coming in to review the patients anyway they would stay there for the hour, and let the ICU nurse step out. And they'd stay there with the buddies and things. So I think they really valued that and felt part of a team." Senior Sister, Critical Care, September 2020 "I think I felt part of the bigger hospital, I think we've worked really well together among the specialities, especially at the peak of everything. We were really good, we had systems in place, we had backup systems. Even simple things like if we couldn't get hold of the ITU reg, there was a consultant number, I think it was a direct line to the ward. So, everybody knew the role that they had to play in the bigger picture, so there wasn't any sort of long discussion, like we normally would have." Registrar, Emergency Medicine, July 2020 "Many people who, for example, who may have had a conflict with one of the intensivists, or we've had some friction, suddenly became really friendly and supportive, and everybody seemed to be aware that we were all vulnerable, we could fall ill, for example." Consultant, Critical Care, December 2020
	Influenced by having COVID-19 as a shared experience	"I think definitely and it's because you have that shared experience." Physiotherapist, Critical Care, September 2020 "We've witnessed something together, but you can say, actually, I can completely depend on that person when everything is really terrible." Senior Sister, Emergency Department, July 2020 "But we all can recognise we've been through it, the team's been through it and we're at the other side now." Senior Staff Nurse, Critical Care, July 2020 "Because it was so clear that we were all in exactly the same boat, having exactly the same feelings" Physiotherapist, Critical Care, July 2020 "I don't think it's so much of a bonding experience, I think it's an experience of exposure and I think we have that commonality in that we've gone through the experience of COVID. So it's almost like a point of reference, like a badge of honour we've gone through this together." Senior Staff Nurse, Critical Care, November 2020 "I think in a sense, going through the pandemic and seeing that absolutely everyone is sometimes, in the same boat." Physiotherapist, Critical Care, July 2020 "No one really knew what to do or what to expect and those sorts of feelings, everyone was so much more vocal about them. It was so much more calming, in a way because it just always comes back to it's the feeling of oh my god, am I totally alone in feeling like this? I think working through the pandemic just really helped to solve that for me." Physiotherapist, Critical Care, July 2020

		"This is part of a problem and part of a good thing. There's a definite shift in the team. So, for a little while, there was a kind of pre-imposed ground fall [?] team. So, the nurses that were in ground fall are very tight. You can't not be tight after something like that." Senior Sister, Emergency Department, July 2020 "So in that sense, yes I guess so because you rely on these other people to get you through. And guess since you're all experiencing the same thing it's so hard to talk to other people about." Physiotherapist, Critical Care, July 2020 "Yes. Because it's something that you've all been through together, and we learned a lot about each other in that time. Everyone learned about the team a lot." Senior Staff Nurse, Critical Care, July 2020 "But again, it's quite, you know, when you're all facing a challenge together, the team kind of comes together." Staff Nurse, Critical Care, October 2020 "But the team, yes, there was like a good feeling of working together during COVID, for, you know, we're all in this shit together kind of thing." Staff Nurse, Critical Care, October 2020 "During the pandemic, it was like this is everyone's job. We all need to do things. It doesn't matter if you're a healthcare assistant or a consultant. We were all in it together." Staff Nurse, Critical Care, August 2020 "Yes. Because it's something that you've all been through together, and we learned a lot about each other in that time. Everyone learned about the team a lot." Senior Staff Nurse, Critical Care, July 2020 "Yes, I think it improved. It was like a trauma that we all went through together. And we knew that we were doing all we could." Junior Doctor, Emergency Department, August 2020 "100%, yes. And not even just their general experiences, so a specific emergency or a specific intervention that you provided that made a patient improve or deteriorate or whatever. It's those specific events and time that would have built that. If you don't have that with someone, then you don't have that common ground." Staff Nurse, Emergency Department, August 2020 "I think there was definitely a feeling of being more united in purpose and in everyone's going through the stress of dealing with this unknown disease." Physiotherapist, Critical Care, September 2020 "But again, like a shared purpose really helps" Staff Nurse, Critical Care, October 2020

		"but by the same token, other things worked better, simply because we had a common agenda." Consultant, Critical Care, December 2020
	Improvement in team dynamics during and post first wave	"I think the behaviour change has definitely stayed but I think also, you developed this bond with everyone there because you were now coming out the other side of it." Physiotherapist, Critical Care, July 2020 "I think it's just purely a function of PPE, honestly, so we came out of a lot of the PPE over the summer and things were returning back to normal and now we're back into putting it all on again and the same patterns of behaviour and habits." Consultant, Critical Care, November 2020 "And that changed how we worked. Obviously, we missed care and things like that, that was the downside to it, but also, I feel like our unit became more efficient with it." Senior Staff Nurse, Critical Care, July 2020 "Yes, I'm an emergency medicine registrar, and I deal with emergencies, but we don't always deal with the super-specialist things, which is handy to call a friend and say, listen, I need some help, I'm looking for an opinion, I'm looking for some advice on a patient with X, Y and Z. And that has improved those relationships." Registrar, Emergency Medicine, July 2020 "during COVID, everyone worked so hard, and they really stepped up to the plate, and I think the teamwork was even better." Consultant, Critical Care, September 2020 "Yes, definitely, yes. Because I know now that we all work as a team." Senior Staff Nurse, Critical Care, November 2020 "Or sometimes it can be fantastic, particularly for example, during the pandemic surge, all this suddenly became a much more friendly, and more positive interaction. We all seemed to suddenly become angels, in trying to support each other." Consultant, Critical Care, December 2020 "in COVID everybody just relaxed slightly and realised that things just weren't achievable." Senior Sister, Critical Care, July 2020 "And actually I think it made people come across in a lot nicer way, and people were doing what they could do and recognised that there were going to be things that just couldn't be done." Senior Sister, Critical Care, July 2020 "Whereas normally the expectation is everything is done when you're handing over, and it can cause an issue or friction if it's not there. And actually that kind of just went." Senior Sister, Critical Care, July 2020 "And it felt like a huge team effort for a variety of MDT, whether they were redeployed as bed buddy and helpers or whether they were in their original roles" Senior Sister, Critical Care, September 2020

		"The team work amongst the doctors, there were some quite good things I found in COVID, we had people from other specialties come and join and I actually quite enjoyed that, in having radiologists and surgeons and the team and that was quite a nice experience to have other people with other skills on the team, it could maybe kick in ideas and expertise, so that was quite nice," Consultant, Critical Care, November 2020 "And obviously when we're in full PPE we didn't want to leave every time after we got into full PPE, so we would go see the one patient that we were doing the prone on and then go help with all the rolls on all the others. And then even when I was going in to treat patients I would ask does anyone need anything? And in that sense it just felt like more of a team" Physiotherapist, Critical Care, July 2020 "And I think it just actually made me realise how many times when I was doing physio I would just go see the patient, do a quick chest treatment on them on ITU and then be like, okay great see you later. Or be like okay can we hoist this patient out to the chair? And actually realising what a big job it is. And it's all the nurses that actually have to do all that bit back. And then I think it made me realise that very time now when I go and see a patient on ITU I'll always ask is there anything that you need with this patient" Physiotherapist, Critical Care, July 2020 "Yes, I think so, I think so. Because everyone's levels were stressed, like very high stress, I mean, that you had to kind of make sure you supported each other. Because no-one knew what to do, how to go about it, patients dying left, right and centre. You just had to work together." Senior Staff Nurse, Critical Care, July 2020 "I became definitely closer with the consultants through COVID than I did before. And I think that's because we were emotionally supporting each other as well." Senior Sister, Critical Care, July 2020 "Because no-one knew what to do, how to go about it, patients dying left, right and centre. You just had to work together." Senior Staff Nurse, Critical Care, July 2020 "But yes, definitely some of the normal medical team that were there were incredibly helpful and they valued that a lot." Senior Sister, Critical Care, September 2020 "We always offer help. Especially during the pandemic, it was actually easier, because everyone new that you would definitely need it." Staff Nurse, Critical Care, July 2020 "But during the pandemic I suppose the team that were there had been there a while, and I think everybody just really pulled together. And it felt like a huge team effort for a variety of MDT, whether they were redeployed as bed buddy and helpers or whether they were in their original roles." Senior Sister, Critical Care, September 2020

		"I think definitely having the proning teams, they moved, so they're working much closer with the nurses, so I think that definitely strengthened that sense of team" Physiotherapist, Critical Care, September 2020 " we've always been a cohesive team, and I think Covid probably just laid the cement a little bit better." Registrar, Emergency Medicine, July 2020 "Yes, absolutely. And they even told me that they appreciated my presence. They were like, a lot of the doctors aren't even here so the fact that you're here makes a big difference to us." Junior Doctor, Critical Care, August 2020
	Incorporation of redeployed staff	"Obviously, because I didn't quite see myself as a critical care nurse, before the COVID, so when you start being deployed [unclear] intensive care, and they just think, okay, she doesn't know what she's doing." Senior Staff Nurse, Critical Care, July 2020 "just in regards to when you insert new people into your group, they will automatically cling to one another because it's all you recognise" Staff Nurse, Critical Care, October 2020 "But it was more difficult when I was just surrounded by people whose names I didn't know, whose background I didn't know." Staff Nurse, Critical Care, July 2020 "Except there was, are you an ITU nurse? Or are you a redeployed nurse? There was a lot of that. Then we had to wear badges that said ITU nurse. I didn't feel like it was the hierarchy, I just felt it was the easier thing." Staff Nurse, Critical Care, August 2020 "Many more people we didn't even know the names of, they were coming in and trying to help. But sometimes they didn't receive enough training before coming to intensive care. It was really, really difficult" Staff Nurse, Critical Care, July 2020 "It was mixed. I think it varied from one minute to the next, because I think everyone was in a state of not so much panic, but we were all tap dancing with the next net. So, we needed people who could help us, and when people arrived, my attitude was that we were so grateful to them for coming. Because they put themselves into a place where they didn't know anyone, or what they were doing, and were probably feeling very childlike in their parent/child continuum." Senior Sister, Critical Care, July 2020 "And I felt a certain responsibility or stress to help those who have come in to understand, this is not how we normally work" Senior Sister, Critical Care, July 2020

		"You see some of them reacting well, and some of them struggling a lot. Particularly the senior nurses who are coming in, you can see them, their instinctive need to fix problems. You saw that coming across." Senior Sister, Critical Care, July 2020 "Yes, instead of asking you questions. I remember before that we would have non-ITU nurses from outpatients or something coming to help us. Then the consultant would start firing questions at them. I would be like, no, no, leave her alone. She is just here to help. Please don't scare her." Staff Nurse, Critical Care, August 2020 " But I think put you in a pressure cooker situation and you add 50 of those people into the mix, some people received it well and others didn't receive it well." Staff Nurse, Emergency Department, August 2020 "And then you'd have lots of extra staff that you're trying to organise and work out where they can work, what they can do, what their background is, are they working within their scope?" Senior Sister, Critical Care, September 2020 "I was supporting a surge nurse that had come from a surgical ward with seven years' experience. And I felt it was a bit like, how am I overseeing you and I'm newly qualified. It was that whole band hierarchy thing. But I mean, everyone just pulled together and we made it in the end" Staff Nurse, Critical Care, October 2020 "there was so many people up here that the kind of whole atmosphere changed significantly" Senior Sister, Critical Care, July 2020 "because also there was so many of them, new people as well, and you were just so grateful that they were there. We were just like thank you. They're not going to be ITU nurses in such a short amount of time with the training they had but we appreciate what skills they did have and what they could add to that." Senior Staff Nurse, Critical Care, July 2020 "And you were just grateful that there was someone there to help you roll, proning, all that sort of stuff, a lot of things take a lot of man power. There were people there that were willing to help and they were always, to me, when I asked for help, they were always enthusiastic to help, so that makes it a positive environment" Senior Staff Nurse, Critical Care, July 2020 "And at times you could sense that they were intimidated by the environment, so you felt like you took them under your wing a bit. You're like this is fine, we can do it and that sort of thing." Senior Staff Nurse, Critical Care, July 2020 "No, I think it helped, I think it very much felt like these people are coming to help and working. Right, great, loads of people have come to help, that's amazing, let's all crack on together. So, I think that potentially helped." Senior Sister, Critical Care, July 2020

		"And yet they still provided an enormous... Even though it's not their area of expertise at all, they provided an enormous amount of leadership in terms of resilience, coping, dealing with problems, and just generally keeping people cheerful. So we had two or three of the senior surgical registrars who were just fantastic, a real pleasure to work with" Consultant, Critical Care, July 2020 "We just embraced each other, it was just like, you have to be grateful they're coming to help you. So, we made sure that, even though it was stressful, you teach whatever you know, and if you don't know it, just say okay, can you ask someone quickly and then come back to me. It just made sure. Some of them actually, a lot of people stayed, after [overtalking] the COVID." Senior Staff Nurse, Critical Care, July 2020 "So they had some A&E staff in CDU. Some CDU staff in A&E, and actually, it was incredible. And I can't express how impressed I am at how quickly they changed the way that they worked." Junior Doctor, Emergency Department, August 2020 "I don't think we did, actually. I think there was on really good integrating of the… We had four, five doctors come in from elsewhere, but no nurses, and they were integrated really well. And the nurses almost excessively took them under their wing to show them how it worked. I think it's very sweet, really." Consultant, Emergency Department, August 2020 "And I definitely heard informal feedback from redeployed doctors and they felt that they were very well-supported." Consultant, Critical Care, October 2020 "Many more people we didn't even know the names of, they were coming in and trying to help. But sometimes they didn't receive enough training before coming to intensive care. It was really, really difficult." Staff Nurse, Critical Care, July 2020 "And then new people came. And we weren't very good at assimilating new people" Senior Sister, Emergency Department, July 2020 "So, often I felt like we were constantly working and then we'd ask them when we needed something. So, a lot of the time maybe they didn't have a role, they didn't know what to do. So, they would stand there talking to themselves. So, you could think there was a bit of a divide there, but that wasn't their fault. It all happened so quickly and we know what we're doing and so we had to get on." Senior Staff Nurse, Critical Care, July 2020

		"think the only caveat I'd say to that is there were a couple who were very unhappy about having been redeployed, and that was noticeable. I don't know that they necessarily affected the whole team, but they were definitely significant outliers." Consultant, Emergency Medicine, July 2020 "Yes, sort of, yes. And some of them did not have a nursing background, some of them are just midwives, and to explain everything when you are so busy, became really complicated and more stressed as well." Senior Staff Nurse, Critical Care, July 2020 "When you're stressed, you tell someone to do something in a way that you would normally do. And I did notice that with quite a few people. I felt really bad for the redeployed nurses at some point, because they just were at the wrong place, at the wrong time." Staff Nurse, Critical Care, July 2020 "I think when everyone came we were in such a state of a mess and so much stress and tension, that people were snapping a lot at the redeployed staff and I did it many times. Afterwards, I was like I'm really, really sorry. I didn't mean to snap at you." Staff Nurse, Critical Care, August 2020 "We had a lot of medical staff redeployed to us as well. And a lot of people who were told you are here to help but we're not really going to let you do anything because you're not an anaesthetist or an ICU trained individual. So, I think they felt really useless" Staff Nurse, Critical Care, August 2020 "I think because it was all quite rush and it happened off the cuff, I think nobody was really prepared for… We didn't know how long they were going to stay as well, so we didn't know that they weren't going to stay longer than three months because they only had a three month contract initially. So we didn't want to put too much training into them at first because we thought they're not going to be here long. And they didn't really have an identity really, which was a shame for them." Senior Sister, Critical Care, September 2020 "So I think actually to be honest they weren't really incorporated into the team very well." Senior Sister, Critical Care, September 2020 "But again those new nurses were assigned very sick patients that they probably didn't have the skills to look after yet with machines they didn't understand, and things like that. So the whole thing was just incredibly stressful" Senior Sister, Critical Care, September 2020 "But then there were obviously a lot of other doctors that were again redeployed so they didn't know ITU, and they don't understand ventilators, it's not what they do. So they were a bit more reluctant to go in because they didn't understand a lot of the questions that the nurses were asking." Senior Sister, Critical Care, September 2020

		"And we're expected to work with people that didn't know what they were doing. Like, you'd get someone to look after two of your four patients, or one of your four patients, and they'd say they are from a [unclear] and they can't give drugs, and they're not happy rolling. They just didn't know what they were doing with the ventilator and that kind of thing. So, that was more stressful." Staff Nurse, Critical Care, October 2020 "And bless them, they tried their best, but they obviously were more of a hinderance. To have to explain everything and make sure they were safe, when I had the patients to look after. And oh god, I don't know how I got through that. My stress levels were through the roof." Senior Staff Nurse, Critical Care, October 2020 "We had people redeployed to our unit who were not actually intensive care nurses. Sometimes, they weren't even nurses. Of course, they were a huge help, but up to a certain point." Staff Nurse, Critical Care, July 2020 "and the worst was that then you started to have the bed buddies. So the bed buddies will come and ask you questions, and you are already stressed." Senior Staff Nurse, Critical Care, July 2020 "So then it was really complicated for the ITU nurses to know what they could delegate to other people" Senior Sister, Critical Care, September 2020 "Yes, I definitely felt appreciated and useful. Particularly during the pandemic, to be honest." Physiotherapist, Critical Care, July 2020 "Yes, I've certainly been accepted and welcomed" Junior Doctor, Critical Care, September 2020
	Breakdown in teamwork during and following first wave	"actually it's been off the back of the peak that we've seen the teamwork slightly breaking down just because I think people are mentally and physically exhausted. And so they don't have the time and the energy to be able to put in to do those extra things." Senior Sister, Critical Care, July 2020 "it's been very difficult, and it is still difficult. So I think the whole teamwork thing has fizzled out a little bit actually." Senior Sister, Critical Care, September 2020 "I think, from a medical point of view, the teamwork is still pretty good, but the nurses are much more fragmented and I think they're struggling with that." Consultant, Critical Care, September 2020 "That's no one's fault. It's not that the teamwork has suffered, it's more that there's been so many obstacles put in the way of the teamwork. I think people are still motivated to work as a team, if that makes sense" Consultant, Critical Care, September 2020

		"I would say the teamwork, the multidisciplinary teamwork has definitely suffered," Consultant, Critical Care, November 2020 "And we tried to look after each other, and we tried to do the job, and that was a huge change in attitude, and I wish we could have preserved it." Consultant, Critical Care, December 2020 "Unfortunately, not. I, and for someone who's very comfortable with having conversations with consultants, I don't really feel that difference anymore. I think there was a massive division, I haven't added a huge amount of stress to the unit." Senior Sister, Critical Care, July 2020 "No. I think, no. From a multidisciplinary team, they definitely didn't feel like this, we're all in this together type of, nobody knows what they're doing, let's just wing it. It definitely didn't feel like that here, unfortunately." Senior Sister, Critical Care, July 2020 "I don't think that sometimes that's been reflected on in quite a rosy way, and I'm not sure it was always that rosy, actually. I think that sometimes, the professions were not helping each other." Staff Nurse, Critical Care, July 2020 "It got worse because everybody had such a huge workload. Nobody really had the chance to support each other." Staff Nurse, Critical Care, July 2020 "I have read that other places were, wow, that's amazing we all worked as one massive team and I'm, wow that unfortunate, definitely didn't happen here." Senior Sister, Critical Care, July 2020 "But once it all got into gear and we had enough PPE I just started dragging them all in because there was that we've not got enough staff in there." Staff Nurse, Critical Care, July 2020 "We definitely had more people, and we were seeing far less of each other. Because normally, I would share several shifts with the same few colleagues. In that context, the team was more diluted. So, maybe I would go for a month without seeing one of my [unclear]. It could have been the shift patterns, or it could have been that I was off sick, and then maybe they were. So, it's all more diluted." Staff Nurse, Critical Care, July 2020 "You saw a little bit more separation and slightly less cohesiveness then we would normally see." Consultant, Emergency Medicine, July 2020 "So just overnight trying to get people to work in teams very differently to how they normally would was quite challenging, for everybody I think" Senior Sister, Critical Care, September 2020

		"It sounds really stupid but the doctors would go off and get their own food and takeaway. And then the nurses would see them eating there, so you don't take away and either that you're not being included or they wouldn't sit with the rest of the nursing staff to have food. So, it was very much a group of doctors and the nurses over here." Senior Sister, Critical Care, July 2020 "And I think that's such a shame. I think for whatever reason, we really cocked that up as a whole team. That added a huge amount of stress." Senior Sister, Critical Care, July 2020 "So the model was a bit unclear, and there was, depending on what your relationship was with the individuals in those areas, it was more or less difficult to negotiate the situation. So that was quite unsatisfactory." Consultant, Critical Care, July 2020 "I'm not sure it was always that rosy, actually. I think that sometimes, the professions were not helping each other" Staff Nurse, Critical Care, July 2020 "I would say I think within different members of the MDT. So I think sometimes the nursing staff would get a bit frustrated" Physiotherapist, Critical Care, July 2020 "Especially if you've been to the ICU in [Location], there's some glass, and all of the nurses are entirely in view. And then, sometimes, some of the doctors would be outside, drinking their water through the glass, and they don't have to wear any PPE to go there. And I struggled with that. A couple of times I said to people, it's unfair for you to just be sat down at the desk, just hanging out. There's quite a few doctors as well, because there's redeployed doctors as well" Staff Nurse, Critical Care, July 2020 "I think we tried. Weirdly I think there was quite a barrier between the medical team and the nursing team." Staff Nurse, Critical Care, August 2020 "The nursing team being given the ultimatum of no you go in, you do eight hours and then you get a break when somebody can come and relieve you. And the medical team not feeling compelled to stay in there. I think it drove a bit of a wedge in between." Staff Nurse, Critical Care, August 2020 "I was writing about people that I've never seen or assessed before. If I was a nurse I would be furious and rightly so. It happens now. We have a pocket of airway generating procedures going on and doctors visit that part of the ward less" Junior Doctor, Critical Care, September 2020

		"it was possibly, and the lockdown itself meant, that things we would do to decompress after a difficult day at work, were not available to us, i.e. go down the pub and have a chat. So, I wouldn't say that the teamwork disintegrated, that would be an over exaggeration, but I would say we were probably not as cohesive as we would normally be." Consultant, Emergency Medicine, July 2020 "maybe I had the psychological, idea that there was an invisible barrier between us." Staff Nurse, Critical Care, August 2020 "Yes, having a barrier I think is a real shame. I feel it really did happen." Registrar, Emergency Medicine, September 2020 "That was a source of a lot of friction, because it was a genuine barrier but it was also accompanied by an unwillingness to go in. That, of course, is a big source. I think that the nurses felt very unsupported in some areas by the doctors." Staff Nurse, Critical Care, July 2020 "waiting for decisions to be made because communication was so difficult." Senior Sister, Emergency Department, July 2020 "Calling in to bays, you're trying to bleep the doctors, trying to bleep anaesthetics because they hold the airways when you're proning patients. Trying to find out who's going to be proned when, and people go off for emergency scans or whatever. So yes, a lot of time waiting I think due to lack of communication." Physiotherapist, Critical Care, July 2020 "And we didn't really work enough, and still haven't, we didn't make much of the first six months since the first surge, to facilitate communication. For example, to have intercoms between bays, and between the staff bays, which would make it much more spontaneous, rather than having to dial a number and ring, bed space so and so, just having an intercom. So, yes, it was a hurdle but by the same token, other things worked better, simply because we had a common agenda. And we had a lot of goodwill, but communication was a problem, yes." Consultant, Critical Care, December 2020 "I mean, as everyone knows, it's been really hard in COVID times because you just don't have that same quality of interaction at the bed space, either because you're not at the bed space because you're doing a virtual ward round for most of it and then just popping by the bed side or because you've got masks and PPE and it's just so darn hard to communicate." Consultant, Critical Care, November 2020 "And we spent a lot of time waiting for anaesthetists to come and help us with the airway, or again communication between departments about who was going to help who and that made things a lot more difficult." Physiotherapist, Critical Care, July 2020

	Changes in support (both received and ability to provide)	"They were kind of tied in to helping us but didn't really want to, or wasn't really sure from their big bosses." Physiotherapist, Critical Care "it made it tricky if you feel like someone's not coming in." Senior Staff Nurse, Critical Care "I think our senior support was, from the physios, our physio senior support was amazing. Even the support from the nurses, the ITU nurses that were welcoming in all these new faces. Bed buddies and redeployed doctors, redeployed staff from all over the place, like PPE helpers..." Physiotherapist, Critical Care "I think when we were being redeployed from the wards we were being moved to other wards initially and I felt kind of safer in ICU than I did on the wards. Because even though you're in full PPE and it's stressful, but I felt I had more peace of mind working there as such." Staff Nurse, Critical Care "Obviously, because I didn't quite see myself as a critical care nurse, before the COVID, so when you start being deployed [unclear] intensive care, and they just think, okay, she doesn't know what she's doing." Senior Staff Nurse, Critical Care "They were kind of tied in to helping us but didn't really want to, or wasn't really sure from their big bosses. Or our big bosses. Or funding issues, about who's going to pay who for these hours and equipment and stuff. And I think that made things a lot more difficult when actually I don't know why people can't just help." Physiotherapist, Critical Care "And again, they helped with morale because they didn't don as much but they were in the staffroom a lot so people could ask things easily. And that made a positive environment and one of them would come round once or twice a day into the COVID area and see if there's anything they could do to help. Which made a good effect." Senior Staff Nurse, Critical Care "But from a clinical perspective and for the more junior staff I would say it was less because the consultants just weren't able to go in to the COVID areas because they were also responsible for patients in other areas" Senior Sister, Critical Care "Because I felt so out of my depth with the lack of support." Senior Staff Nurse, Critical Care "So, especially with retrospect, I didn't feel well prepared. I didn't know where stuff was, who everyone was and then I didn't have very basic things like ventilator training. So, my troubleshooting at the moment has been a bit slow really." Junior Doctor, Critical Care "So I'm grateful to have been in a supportive team because I think it would have been a big struggle otherwise." Physiotherapist, Critical Care

		"I feel like our matrons did a good job, they stepped up, they were present on the unit a lot, they changed their shift patterns so there was someone there every day of the week. And they were there, the long day shifts, 7:30 till 8." Senior Staff Nurse, Critical Care "accompanied by an unwillingness to go in. That, of course, is a big source. I think that the nurses felt very unsupported in some areas by the doctors." Staff Nurse, Critical Care "But I never thought that I had to battle with doctors to come in and support, if it was necessary. They were always very willing to do that." Physiotherapist, Critical Care "But generally, I was very well supported by senior [unclear] staff and then, the nursing staff and other health professionals were just amazing. They just got on with it" Junior Doctor, Emergency Department "And they are just telling us off in no little reason, if you were five minutes late, oh, blah blah blah." Senior Sister, Critical Care "We all were supported in the way that we all help each other, despite differences. They behaved wonderfully." Staff Nurse, Critical Care "I think I'm lucky to be working where I am. Everybody was very, very supportive." Junior Doctor, Emergency Department "I think maybe because it was stressful for everyone, everyone made extra effort to help people around them. It was a different situation and a very different reality to what we normally experience. There was much more understanding and, I guess, mental support." Senior Sister, Critical Care "That's all you can do, if you do your job to the best of your ability then I feel like I can always walk away and feel okay." Senior Staff Nurse, Critical Care "I wasn't as experienced as a lot of other people were during the surge and stuff so I had to just step up." Staff Nurse, Critical Care "We were expected to step up a bit more in terms of being able to be more confident in our own decision making because there were more patients to see." Junior Doctor, Emergency Department "And I didn't have any time to support the ITU nurses, or the ITU doctors, or people that were already there. And they were thrown in a situation that was very difficult for them, to work with lots of new people that they don't know, to try and train them up as well as looking after some really sick patients. " Senior Sister, Critical Care

		"I wasn't so supportive to new staff as I could have been because of the workload" Staff Nurse, Critical Care "And they were thrown in a situation that was very difficult for them, to work with lots of new people that they don't know, to try and train them up as well as looking after some really sick patients." Senior Sister, Critical Care "And at times you could sense that they were intimidated by the environment" Senior Staff Nurse, Critical Care "But again those new nurses were assigned very sick patients that they probably didn't have the skills to look after yet with machines they didn't understand, and things like that. So the whole thing was just incredibly stressful." Senior Sister, Critical Care "I realised, even myself, I wasn't so supportive to new staff as I could have been because of the workload." Staff Nurse, Critical Care "That [training] wasn't happening. And that was all side-lined and that obviously impacts on their development in some shape or form." Senior Sister, Critical Care "that's been a thing where we're aware that nurses have really struggled, and we've tried really hard to reverse that but it's just really hard to do, to spend adequate time." Consultant, Critical Care "But from a clinical perspective and for the more junior staff I would say it was less because the consultants just weren't able to go in to the COVID areas because they were also responsible for patients in other areas. They weren't putting on PPE and stuff, so the visibility of them in the clinical area and communication with the junior staff wasn't how it is normally." Senior Sister, Critical Care "I think so, yes. I think so. I got a lot of calls asking questions, and I would go in if they needed me, but there were definitely times when we troubleshooted things over the phone, and again that's not something that we'd normally do." Senior Sister, Critical Care "Normally, we'd just pop round the corner and, let me just check that, or I would just have a quick look at the sheet and stuff, so that's the only thing that happened for us." Consultant, Critical Care
	Changes in nursing autonomy	" I remember one shift where resus was completely full. I was in charge resus. ITU were just refusing to come down. I think, in their heads, they were like, we're full and there is bugger all else we're going to do. And A&E can just do their

		thing. And so, as nurses, we were making the decisions to prone patients." Senior Sister, Emergency Department, July 2020 "And we were like, right.. So, we were proning patients ourselves." Senior Sister, Emergency Department, July 2020 "I really, really acknowledge and am really sensitive to the autonomy of ITU nurses." Staff Nurse, Critical Care, October 2020 "the nurses on the bed side that were handling the acute situations that you would normally have your reg's come in for" Staff Nurse, Critical Care, October 2020 "But then I guess it all just helped with the learning side of it too, I guess it got you in more of an autonomous role to, rather than relying on the doctors, we were like, oh no, we've got to do it ourselves now." Staff Nurse, Critical Care, October 2020 "Yes, definitely, yes. And I felt like got exposed, obviously the patients I would look after, they were really high acuity." Staff Nurse, Critical Care, October 2020 "Nobody heard the emergency alarm, the bed buddies didn't know what it was, and it was four in the morning. It was my patient, and one of the nurses was bagging the patient for ten minutes before anyone came." Staff Nurse, Critical Care, October 2020 "No, normally twice a day we have a doctor's ward round where they are physically on the unit, walk around and review the patients. But that stopped happening. And I suppose it was just the lack of medical presence on the floor, so literally if you had an emergency and you called the emergency call bell, you had to wait for the medical staff to don up, come in whenever" Senior Staff Nurse, Critical Care, November 2020 "There wasn't much medical presence, if I'm being honest, on the unit at the time. I think the nurses felt a little bit more like, we're kind of here on our own dealing with it a bit more than in a standard situation because there's more medical presence." Senior Staff Nurse, Critical Care, November 2020 "You are sweating, your face is hurting. I think as well because I've been clinical and in charge on the ward and stuff. So, I think that experience did help me with organising and saying you need to do this" Staff Nurse, Critical Care, August 2020 "And I think ITU nurses by their nature like to just do everything, they're used to having one patient and just getting on with it. So it's difficult for them to take a step back and realise they've now got four, which is different to normal, and then get other people to do stuff and to try and delegate that appropriately. That's not the way they work." Senior Sister, Critical Care, September 2020

		"It was strange, because you weren't actually working with the team that you're used to, because the ratio changed. So, you'd be the only ITU nurse in the area, and everyone else was redeployed from other areas. So, you don't necessarily know everyone's strengths, and a lot of people weren't trained in critical care. You knew the medical team. They weren't really inside. There was the inside and the outside. It was like through the glass. You're in the PPE and there's everyone outside. So, you're a bit more on your own" Staff Nurse, Critical Care, July 2020 "So, in resus, just nurses with the sickest patients you have ever seen in your life" Senior Sister, Emergency Department, July 2020 "they were looking to me to provide the answers, even though they were more senior. So, I found that quite difficult" Senior Physiotherapist, Critical Care, July 2020 "That was so stressful. Another stressful factor was if my patient was deteriorating, the doctor in the room wouldn't be an ICU doctor or an ICU trained doctor. I was like, oh my god, my patient is desaturating and I've got a surgical reg here" Staff Nurse, Critical Care, August 2020 "It was strange, because you weren't actually working with the team that you're used to, because the ratio changed. So, you'd be the only ITU nurse in the area, and everyone else was redeployed from other areas." Staff Nurse, Critical Care, July 2020 "sometimes I would just do it on my own because there was nobody coming in. Nobody wanted to come in, or they wanted to come in and they couldn't come in" Staff Nurse, Critical Care, October 2020 "There wasn't much medical presence, if I'm being honest, on the unit at the time. I think the nurses felt a little bit more like, we're kind of here on our own dealing with it a bit more than in a standard situation because there's more medical presence." Senior Staff Nurse, Critical Care, November 2020
	Changes in responsibility	"you could sense that they were under a lot more pressure. Their patient load went up a lot. Normally they'd look after 16 but at days they were looking after 32. Their workload doubled." Senior Staff Nurse, Critical Care, July 2020 "I felt very guilty and I felt like I had to support a lot of people through that, so that was quite difficult," Senior Physiotherapist, Critical Care, July 2020

		"by redeploying so many physios into that team, I basically decimated my out of hours staff. So, then I went from having about 20, 25 people per rota, to five, and so covering that rota was very stressful" Senior Physiotherapist, Critical Care, July 2020 "I guess it was just the responsibility that I felt, having to look after so many people" Senior Physiotherapist, Critical Care, July 2020 "but when we were in the peak of the surge, as much as you wanted people to open up and debrief, there was a certain element was, well we've still got a lot to do, and we still need to get on with I" Senior Physiotherapist, Critical Care, July 2020 "the other thing I found, during COVID, even though the teamwork may have been amazing, there were so many things that were not done to best practice because of how people were stretched. And I think I often had to bite my tongue quite a lot regarding things that were let slip, sadly, with the nursing staff. And as I said, I couldn't blame them at all." Consultant, Critical Care, September 2020 "When it began, even the senior people were panicking and then all running up and down. Not really shouting, I'm not saying shouting, but we can see the stress on their face" Senior Staff Nurse, Critical Care, November 2020 "But I think the nurses that when they saw me come in they suddenly felt really relieved that I was there, and I just suddenly felt this overwhelming pressure like I don't even know what's going on." Senior Sister, Critical Care, September 2020 "And then everyone's looking at me and oh God I'm supposed to be really senior and I've no idea what's happening. And then I felt really overwhelmed and wanted to get out as quick as possible." Senior Sister, Critical Care, September 2020 "So, it's not always just the speciality, often it falls on me as the reg, or my colleagues who are senior, when there's not a consultant around to make that call. And especially, more so at the minute, because, obviously, there's nobody else around." Registrar, Emergency Medicine, July 2020 "There are people who are really generous with their time, but there are people I'm asking now and I'm a bit like is this something that I really should have got under control in the very early days?" Junior Doctor, Critical Care, September 2020 "For me, stepping into roles that I wouldn't normally do or things or decision-making I wouldn't normally do, there's a short burst of stress followed by an increase in capability" Staff Nurse, Critical Care, July 2020

		"it might have been different from one bed space or one day to the next depending on the specific person in that bay at that specific time and their skill set. Had you have had a senior nurse as a junior doctor, your role and responsibilities might have been a lot more fluid than what they usually would be." Staff Nurse, Emergency Department, August 2020 "I think because if something happened with your patients, it was your responsibility to deal with that at the time, because other people there, you can't expect them to know what to do, because they're not trained in intensive care." Staff Nurse, Critical Care, July 2020 "obviously, as support staff, we were asked to support the hospital outside of our usual working roles," Senior Physiotherapist, Critical Care, July 2020 "The nurses were run off their feet. They were terrified. When their ratios changed from one-to-one, to one-to-two, before they got the bed buddies in, it was an absolute, unmitigated disaster." Consultant, Critical Care, September 2020 "I think it did change. I think we became a much more of an emotional support. Probably, although technically yes, we were there, but I think emotionally we were supporting people with a lot of… Trying to relax and debrief them, let them talk about stuff to us as opposed to clinically trying to solve their problems." Senior Sister, Critical Care, July 2020 "if I didn't have a handle on it, it would reduce, not just the trust the colleagues have, but actually increase their anxiety because they're looking to me for assurance and reassurance." Consultant, Emergency Medicine, July 2020 "But I'm afraid if you've got 32 or 64 patients that you are responsible for, just because you're off to one patient's bedside doesn't mean you're not at one of the other 63's." Consultant, Critical Care, July 2020
CHANGES IN PSYCHOLOGICAL SAFETY	**Improved by "the unknown"**	"Yes I think so, because it's so unknown, yes. Obviously no one really knows and you go looking for seniors and they don't know either so it's easier to kind of talk about it as a group rather than someone having an issue, yes." Physiotherapist, Critical Care, July 2020 "I do think there was a change, but I think that was true for everyone that was there or that was redeployed or that was existing staff because I think it was just so… Everyone uses that word, unprecedented and I kind of hate that word now but it was so new, wasn't it?" Physiotherapist, Critical Care, August 2020 "100%, yes. I think there was also, even the people that were usually looked to for guidance were quite happy to admit that they didn't know because no one knew. And so it breaks that barrier of you should know, whereas they didn't and

		they weren't expected to almost. It was like a more informal, let's try this. What do you think? It was that, or what do I do now?" Staff Nurse, Emergency Department, August 2020 "When Covid came, all of a sudden, nobody was an expert, but I had had some previous experience with something a bit similar. So, I felt more confident than even somebody who was more senior than me' Staff Nurse, Critical Care, July 2020 "Yes. Because no one knew what they were doing. And I like the research so I would be reading journals and I could ask the consultants. We never ventilate anyone APRV, we don't use it. Then I was seeing papers saying that maybe that works for COVID patients. So, you just ask, which was nice to be able to have a more level field on that kind of thing." Senior Staff Nurse, Critical Care, July 2020 "I think it was obviously in keeping with everyone's behaviour changing because we were all a bit like, this is new, for absolutely everyone here. No one's really experienced anything like this before. I think they were really open to chatting to us. Especially the physios, I noticed. Whereas they can be a little bit dismissive of our weaning plans or treatment plans or something like that, but I did notice that, during that pandemic, they were very much like what do you guys think?" Physiotherapist, Critical Care, August 2020 "But there might not be as much experience with just the whole situation, in general. Even if it was things about staff management or I don't know, PPE or positioning or something like that, I do think that it was easier to vocalise, if there was anything" Physiotherapist, Critical Care, August 2020 "I think there was also, even the people that were usually looked to for guidance were quite happy to admit that they didn't know because no one knew. And so it breaks that barrier of you should know, whereas they didn't and they weren't expected to almost. It was like a more informal, let's try this. What do you think? It was that, or what do I do now?" Staff Nurse, Emergency Department, August 2020
	Empowerment and improved psychological safety as a consequence of COVID-19	"Probably more so after COVID, yes. I think people are a lot more sympathetic I reckon, and more I guess maybe less judged for bringing up issues." Physiotherapist, Critical Care, July 2020 "Probably just from the whole MDT camaraderie point of view as well. People would kind of respect your opinion a bit more." Physiotherapist, Critical Care, July 2020 "So, I think there was a facilitated broadening of responsibilities of care and opportunity for discussion. So, I think that was done quite nicely actually thinking about it" Junior Doctor, Critical Care, September 2020 "People certainly felt very free to contribute in a positive way and did so." Consultant, Critical Care, July 2020

		Whereas now I think everyone is just slightly more aware that it is hard and it's actually okay to have an issue." Physiotherapist, Critical Care, July 2020 "I feel more confident being able to speak up and being heard." Physiotherapist, Critical Care, July 2020 "I think in that sense it then made me feel like actually it's fine to ask those questions and to actually have the confidence to be like, can I see something new? Or if you do have a question about something that you might feel is ridiculous to ask, having the confidence to ask them because you know them." Physiotherapist, Critical Care, July 2020 "But I think after COVID I would definitely have more confidence to speak to the nurse in charge, to go find a registrar if I had a question about something. And just go into the doctor's office and ask a question rather than speaking to the nurse first, or speaking and getting advice from my senior. I'd rather just go to where I knew the answer could be." Physiotherapist, Critical Care, July 2020 "I think we were all so vocal and so open about how mad this whole situation was, that it left it all out there. There was nothing that was unsaid, if that makes sense." Physiotherapist, Critical Care, July 2020 "It was everyone was just quite candid with each other, and real." Physiotherapist, Critical Care, July 2020 "So, in the case where we've been rehabbing a lot of long-term COVID patients, where there have been a lot of barriers to their progress, I would say it's been a really open environment to raising concerns and suggesting new approaches. And I've never had any hesitation in doing so." Physiotherapist, Critical Care, September 2020 "Yes definitely. I think there was a big barrier as well broken down I felt between the physios and the nursing team. Because we were proning we were there on night shifts with them, we were helping with repositioning." Physiotherapist, Critical Care, July 2020 "I think because a couple of times the consultants would come around and then they'd change some things. And you'd have to say to them, look, I'm the only person here who, if something goes wrong with that change that you've made, can deal with it. I just need to be there when you're making these changes, because I need to know. And they were respectful of that, to be honest, when they were doing their rounds." Staff Nurse, Critical Care, July 2020 "I think so. Probably more so after COVID, yes. I think people are a lot more sympathetic I reckon, and more I guess maybe less judged for bringing up issues." Physiotherapist, Critical Care, July 2020

		"So, I think it was important, and then, I think, then that gave them the time to open up, when maybe they didn't feel like they could or because we were so busy, and as such in crisis mode, that it gave them the opportunity that they could speak up." Senior Physiotherapist, Critical Care, July 2020 "You could always talk to someone, because the patients that we were getting, they were sick, but everyone was the same" Staff Nurse, Critical Care, July 2020 "There was an opportunity each day for consultation about management plans and how to look after someone." Junior Doctor, Critical Care, September 2020
	Lack of psychological safety during COVID-19 / New barriers to psychological safety created by COVID-19	"It definitely wasn't during COVID, because there were mistakes that were made. Not major ones, but just in terms of the different stuff that we're working with. And before and after, I don't think it is really, but it was probably highlighted more in our safety briefings and things like that. Whereas previously I think it was rushed over." Staff Nurse, Critical Care, July 2020 "during Covid, I found it more difficult to raise concerns because of the time constraints." Staff Nurse, Critical Care, July 2020 "But it was more difficult when I was just surrounded by people whose names I didn't know, whose background I didn't know. I didn't even know who was more competent than me doing what. If you are with people you don't know much about, then it gets difficult." Staff Nurse, Critical Care, July 2020 "Not necessarily the ward round but PPE was a good example. They didn't feel PPE was good enough. If I had a question about the PPE and why it had changed, I'd go and speak to the Matron and be like what's the new change? Whereas they felt they couldn't and that created a bit of tension there." Senior Staff Nurse, Critical Care, July 2020 "Sometimes there were comments from them that they felt they couldn't raise concerns." Senior Staff Nurse, Critical Care, July 2020 "I think with the stress of your role, even myself, I'm really not that person to speak to people" Staff Nurse, Critical Care, July 2020 "I think our structure and hierarchy, above my level, changed during Covid, and sometimes it wasn't always clear who the right person was to go to." Senior Physiotherapist, Critical Care, July 2020

		"But it got to the point where nobody was speaking up because they didn't have time to." Staff Nurse, Critical Care, August 2020 "The reality was no one had time to ask anything and we were all on walkie talkies, behind masks, visors." Consultant, Critical Care, September 2020 "I don't think that environment was conducive to anything, to be honest." Consultant, Critical Care, September 2020 "they felt they weren't well received or they didn't know who to speak to." Senior Staff Nurse, Critical Care, July 2020 "I think raising concerns, and I think especially during COVID there were a lot of issues with PPE. And I think it was really difficult for people who were in the hospital every day, so like the nurses in charge organising everything on ITU, organising the amount of staff, and obviously knowing there's not enough PPE." Physiotherapist, Critical Care, July 2020 "So I think that sense of them raising the concern of something that has been an issue I think it did cause some tension. Because I think some of them weren't there all the time, so when they were there they were like, oh well this is an issue, and then I think it was already seen as an issue. But I feel like until they sometimes raised the concerns nothing was done." Physiotherapist, Critical Care, July 2020 "I think during COVID, people did raise concerns about the obvious things, but I think because we're all in the same boat, it was quite difficult because you know that you're having the same problem as everyone else." Staff Nurse, Critical Care, July 2020 "And so, there were times when having a lot of voices was unhelpful in that we spent too much time airing views and debates about stuff which there wasn't a right answer to. And really, what it needed was maybe less voices and also the boss makes a decision and we just get on with the day. Does that make sense?" Physiotherapist, Critical Care, September 2020 "It was just carnage. We lost control completely. I think it was only for about three weeks that it completely went. But it got to the point where nobody was speaking up because they didn't have time to" Staff Nurse, Critical Care, August 2020 "The reality was no one had time to ask anything and we were all on walkie talkies, behind masks, visors." Consultant, Critical Care, September 2020
IMPACT OF PERSONAL	**Difficulties in communication**	"wearing all full PPE so you don't know who everybody is" Senior Staff Nurse, Critical Care, July 2020

PROTECTIVE EQUIPMENT		"PPE communication got difficult, yes, not knowing who anyone was in PPE." Staff Nurse, Critical Care, August 2020 "There's quite a lot of me shouting instructions at people and then PPE communication got difficult, yes, not knowing who anyone was in PPE." Staff Nurse, Critical Care, August 2020 "And I don't know how much of that is because you're behind a mask every day and some of that coms isn't as good as it would normally be." Consultant, Emergency Medicine, July 2020 "No, normally twice a day we have a doctor's ward round where they are physically on the unit, walk around and review the patients. But that stopped happening. And I suppose it was just the lack of medical presence on the floor, so literally if you had an emergency and you called the emergency call bell, you had to wait for the medical staff to don up, come in whenever" Senior Sister, Critical Care, July 2020 "I don't see many people without their masks. Yes. You're kind of closer, but you don't really see each other." Physiotherapist, Critical Care, September 2020 "I definitely rely on a nurse's name being on the board by the patient's bed or a name tag, and you don't have that. You can't even see their faces. Yes. It definitely makes it a lot harder." Physiotherapist, Critical Care, September 2020 "FFP3, nobody could hear me." Registrar, Emergency Medicine, September 2020 "And even people I knew, you'd be just talking to them for a few minutes and then you'd go, oh, hello, oh, it's yourself, kind of thing. So, I think the PPE was a massive barrier, actually, in that respect, but there was nothing you could do about it, really." Consultant, Critical Care, September 2020 "I wouldn't say that much of a barrier, but there were times when I mistook someone just because we were in the full PPE" Staff Nurse, Critical Care, October 2020 "either because you're not at the bed space because you're doing a virtual ward round for most of it and then just popping by the bed side or because you've got masks and PPE and it's just so darn hard to communicate." Consultant, Critical Care, November 2020 "Difficult to know, it was a barrier, to go into a bay with COVID, obviously you had to put the whole gear on, so you tried to solve a lot of things on distance, over the phone or making signs, or putting a blood gas [?] on a window. So, yes, there was a physical barrier, and hearing was very difficult, the voice gets very difficult to hear under an ffp3 mask, or a personal respirator." Consultant, Critical Care, December 2020

	Physical difficulties and the impact of wearing PPE	"And then feeling claustrophobic and stuff in all the gear, staying in for four hours, waiting around for people." Physiotherapist, Critical Care, July 2020 "It was wearing PPE for six hours is hard. And, in the beginning, I remember it was half an hour, and we were getting upset. They were all so heavy. And then, by the end of it, wearing it for six hours. And I think it was a bit quiet among all of us. I don't know. It wasn't how we normally would be in the break rooms and things like that." Staff Nurse, Critical Care, July 2020 "You are sweating, your face is hurting." Staff Nurse, Critical Care, August 2020 "I don't know. Maybe. We have all started seeing things a bit different I think on a personal level, professional level, but it's the constant stress of that from the mask that we need to wear all the time" Registrar, Emergency Medicine, September 2020 "I think it was probably more stressful being in full PPE all day long and what have you" Staff Nurse, Critical Care, October 2020 "The thing is, the stress isn't even just because of the patient load. It was wearing PPE for six hours is hard" Staff Nurse, Critical Care, July 2020
	Shortages of PPE	"Yes, definitely, and in fact, the shortage of PPE made that a real problem, because I couldn't just go and do that check-in with multiple people in multiple areas like I normally would do. And I really found that very hard, because actually there just wasn't enough PPE, it wasn't a good use of the available PPE. I didn't mind putting it on and off. If there'd have been more of it, I'd have done it." Staff Nurse, Critical Care, July 2020 "because I wasn't going, oh, I really want to go, but if I do that, maybe there won't be enough for the night staff." Staff Nurse, Critical Care, July 2020 "Yes, definitely, for everybody, and that was one of the biggest problems the whole way through, that you're constantly weighing up, is this reason to leave a room or go into a room worth the impact on PPE?" Staff Nurse, Critical Care, July 2020 "I think especially during COVID there were a lot of issues with PPE. And I think it was really difficult for people who were in the hospital every day, so like the nurses in charge organising everything on ITU, organising the amount of staff, and obviously knowing there's not enough PPE." Physiotherapist, Critical Care, July 2020

		"But yes, I think there was definitely a stage where I don't think we ever ran out of any PPE at [Name]. We got dangerously close to the last box of masks, and people stayed in a lot longer," Senior Sister, Critical Care, September 2020 "But yes, definitely not having enough PPE was a problem at various points. It felt like I wasn't an essential entity, I should leave that for a doctor that's going in to review the patient or the proning team. I sorted that." Senior Sister, Critical Care, September 2020 "And then if they're working in the PPE, we didn't have the right PPE all the time which was concerning" Staff Nurse, Critical Care, October 2020 "And then when the doctors were coming in and being like, oh well there are no masks. And they were like, there are no masks and masks fit tested poor, what are we going to do? And they're like well yes none of the nurses, no one's had the correct masks they've been fit tested for, for the last two week" Physiotherapist, Critical Care, July 2020 "I think the PPE did make it difficult, communication was sometimes very difficult, just hearing each other. And also, where PPE was so limited, where you might have said, oh I'll come and help you with that patient, we had to basically… I was [unclear] clinical A&E at Charing Cross. So, if they weren't on my side to treat, then potentially I couldn't go to the other side, because I felt bad for wasting PPE. So, that was quite tricky." Senior Physiotherapist, Critical Care, July 2020 "I'll see the ones on this bay and that bay, you had to basically see one bay and everybody in there to save PPE. So, I think that was quite difficult" Senior Physiotherapist, Critical Care, July 2020 "So, in that instance, for example, we would've just had a quick look, but every time, when somebody wants to have a quick look, they have to don PPE and there was already… We came down to the wire quite a number of times where there was no PPE left and where people were looking for gowns and finding them stored away in cardiology, or cath lab, or somewhere. And getting the site manager and saying, we have no more gowns or we have no more this, that and the other." Consultant, Critical Care, September 2020
	Barriers arising as a result of PPE	"Whereas they weren't even coming in to do ward rounds because of COVID it was all done kind of via teams and most of the time without the bedside nurse at all." Staff Nurse, Critical Care, August 2020 "they felt that it was the doctors if not also the healthcare assistants as well, who had not received any training at that time. So, they kind of blanket blamed us not themselves. But we did notice that the doctors were a lot more casual about the PPE at the time and it created a bit of a division between the nurses. I saw nurses wearing two sets of gloves, with the first set of gloves sticky taped to the gown, with the upper set of gloves able to be removed and replaced. I never saw any of the doctors do that" Staff Nurse, Critical Care, October 2020

		"I didn’t see one doctor for at least four days" Senior Staff Nurse, Critical Care, October 2020 "I felt like they didn’t want to don that often” Senior Staff Nurse, Critical Care, July 2020 "Whereas a lot of the consultants wouldn’t often don and come into the COVID area" Senior Staff Nurse, Critical Care, July 2020 "it took a long time to get a doctor into that PPE area and I think that generated a lot of stress and anxiety for the nursing staff." Senior Sister, Critical Care, July 2020 "The physical barriers also, if you were going on for a shift, you would say, all right, I'm going to don. I'm going to go in. I'm going to go around, and then I’m going to get out and do the things that I can do away from the bedside. And the nurses certainly found that there was less doctor presence, generally. I'm not sure about consultant presence specifically, but the nurses certainly objected to that and rightly so, I think." Consultant, Critical Care, July 2020 "what I heard from the nurses, was frustration that when they’d ask for help it wasn’t instantly there where it would normally be and there was a bit of a wait." Senior Sister, Critical Care, September 2020 "But, it did mean that our interaction with the nurses, I don’t even know if they felt they saw us. Do you know what I mean? Because we would come in and you could be in there for two or three hours yourself. But, A, there were lots of agency, B, there were lots of people from GICU that we didn’t know and, C, you could be anybody. There was this thing in writing with [unclear], changing an apron between patients, so you can’t write it every single time." Consultant, Critical Care, September 2020 "there was kind of a little bit of discomfort between nurses and doctors." Consultant, Critical Care, October 2020 "Because, and they did raise this issue in one of the review meetings, that they felt that the trainees, especially the junior trainees, were not seen in the unit, in the red area." Consultant, Critical Care, October 2020 "I think there was a lot of issues with the medical team and the nursing team, because I think the nursing team felt very much that there wasn’t a lot of medical presence on the unit" Staff Nurse, Critical Care, October 2020 "If anything, there was a massive divide between the nursing team and the medical team. Because the medical team weren’t as visible and present on the floor and were doing their rounding from an office, so it infuriated the nursing staff. So there was a massive divide and a lot of animosity. There was a lot of complaints made about that." Senior Staff Nurse, Critical Care, October 2020

		"So I think they were possibly a bit more stand-backish in terms of medical support because physically they weren't present on the unit either half as much." Senior Staff Nurse, Critical Care, November 2020 "like the nurses felt quite abandoned, not enough doctors on the shop floor, hard to get hold of a doctor, not nearly so much time at the bed space with doctors because of all the PPE requirements." Consultant, Critical Care, November 2020 "I think the barrier became the nursing staff were in the red zone and they were in there all the time. And the doctors were coming in and out and I think that was an active barrier. So, there was a lot of stresses, especially during night shifts" Senior Sister, Critical Care, July 2020 "No, normally twice a day we have a doctor's ward round where they are physically on the unit, walk around and review the patients. But that stopped happening. And I suppose it was just the lack of medical presence on the floor, so literally if you had an emergency and you called the emergency call bell, you had to wait for the medical staff to don up, come in whenever" Senior Staff Nurse, Critical Care, November 2020 "So I think sometimes the nursing staff would get a bit frustrated as we would just come in and do proning and do rolls. And then we would be able to go away and get more of a break, and we didn't have to stand there and be in PPE for as long as they were. The longest we were ever in PPE for was three and a half hours, whereas the nurses were in there for five or six hours" Physiotherapist, Critical Care, July 2020 "You knew the medical team. They weren't really inside. There was the inside and the outside. It was like through the glass. You're in the PPE and there's everyone outside. So, you're a bit more on your own." Staff Nurse, Critical Care, July 2020 "I think it did, but they were quite aware that that was a big barrier and so, there was never any issues with just picking up the phone. They were like, we're literally just in there, see what you think." Physiotherapist, Critical Care, August 2020 "But yes, definitely the physical barriers of [unclear] and PPE and stuff meant that it was difficult to access that immediate clinical support." Physiotherapist, Critical Care, August 2020 "Yes, so there was a shortage of PPE so we got told right at the beginning we got told only essential staff to go in. And that trickled down from the consultants to the teams that they were leading as you don't go in unless we need you. So, we didn't have a lot of space left up here. The nurses would quite often walk past the room that we crammed all the doctors into whilst they were on a break. And the doctors would all be sat there doing nothing. And it felt like a disparity when in reality they were told not to come in." Staff Nurse, Critical Care, August 2020

		"It's not even about presence, it's the accessibility because we can't walk to the doctor's office or we can't say, look doctor, come in here, I'm under pressure. We don't have that luxury because it's a bit of a mouthful to get all the PPE on before the medics can come in to us. So there is that physical barrier that has made it so the medics can't be more present." Senior Staff Nurse, Critical Care, November 2020
CHANGES IN WORKPLACE STRESSORS	**Impact of COVID-19 on workload and working environment**	"It was madness, absolute madness, but it was life and the tense situation. We adapted to whatever came so it was madness because there was no control about anything." Staff Nurse, Critical Care, July 2020 "But I guess there's all that stuff that we don't really think about that was going on. I think all the kind of structural, all that kind of stuff has made it more difficult." Physiotherapist, Critical Care, July 2020 "eventually, we got more used to the disease and what the hell was happening and stuff. But, that very initial first weekend in April was pretty horrific." Consultant, Critical Care, September 2020 "I just felt bad for the patients, because if you're stressed, sometimes you can't even look after the patients properly." Senior Staff Nurse, Critical Care, July 2020 "Covid has added a whole new level to it. Previously, it wasn't that stressful" Staff Nurse, Critical Care, July 2020 "everything went crazy, and we were dealing with a totally new disease in a totally new environment" Staff Nurse, Critical Care, July 2020 "Very stressful, yes" Senior Staff Nurse, Emergency Medicine, July 2020 "During COVID, definitely felt the stress a lot more," Physiotherapist, Critical Care, July 2020 "During the COVID, each of them, more mental exhaustion. You're dealing with patients that cannot see their families, they're tubed. Some of them are very, very sick and might be dying, and you have to deal with someone over the phone. Especially that is the family that is also distressed." Senior Sister, Critical Care, July 2020 "that was stressful because I had too much to do in very little time." Senior Sister, Critical Care, July 2020 "And then, of course, we've had the pandemic, which is extremely stressful. That was a completely different level of stress that I haven't really been through before." Staff Nurse, Critical Care, July 2020

		"I would say that everyone's been working under a heightened background stress level for the last six months or so." Senior Sister, Critical Care, July 2020 "So, it's increased patient numbers, there was a lot of unknown, there was a lot of staff burnout and staff stress." Senior Physiotherapist, Critical Care, July 2020 "It was pretty chaotic" Senior Physiotherapist, Critical Care, July 2020 "Obviously COVID was a whole different story. It all went to pot then." Staff Nurse, Critical Care, August 2020 "I think ITU is a stressful environment anyway, but it doubled, tripled over the course of a few weeks." Senior Sister, Critical Care, September 2020 "So it's an absolute domino effect, this pandemic, not only the pure COVID cases and the masks and all the other restrictions that we're having." Registrar, Emergency Medicine, September 2020 "COVID wise, obviously it was stressful for everybody" Staff Nurse, Critical Care, October 2020 "It was different. It was a different stress." Staff Nurse, Emergency Department, October 2020 "obviously COVID was the most stressful time." Staff Nurse, Critical Care, October 2020 "There was too many stresses at one time." Staff Nurse, Critical Care, October 2020 "God, everything was stressful." Staff Nurse, Critical Care, October 2020 "I went in, straight into the deep end with COVID and so yes, it was really stressful to be honest." Staff Nurse, Critical Care, October 2020 "The individual patient contact was more stressful because you had a greater awareness of how sick they were and the potential to deteriorate" Consultant, Emergency Medicine, July 2020 "And they were all six level-three patients that we were having, so you definitely felt it more than you normally would." Staff Nurse, Critical Care, July 2020 "Pre-pandemic, I normally don't find work that stressful. It was stressful if I had a sick patient, but it would be easier. If

		there was one sick patient, no other patient would be as sick as them, so everybody would help out. Whereas during COVID, everyone was sick. Everyone was proned and on filter and on every infusion know to man. So, you helped each other but it wasn't like before if that makes sense." Staff Nurse, Critical Care, August 2020 "All the patients were so unbelievably sick" Staff Nurse, Critical Care, August 2020 "We went from only having four or five really sick patients per shift to all of them are really sick. They're all ventilated." Staff Nurse, Critical Care, August 2020 "that was absolutely horrendous, I was doubling two very sick patients. It was pretty gruelling." Senior Sister, Critical Care, September 2020 "Like, normally when you walk around the ITU Unit, if you saw, we have maybe a few very sick patients. And during COVID if you'd walked around, let's say 16 beds, so part of the unit, it was like every single patient was what we'd normally call acutely unwell. So, that was one thing, you know definitely, all of them were acutely ill. And then it was just that we often had more than one patient that was our responsibility, which obviously adds to the pressure." Staff Nurse, Critical Care, October 2020 "Anything... You get two Level 3s, and two ventilated patients, and it was just really, really stressful at the time." Senior Staff Nurse, Critical Care, July 2020 "There was things weren't getting picked up not because they were not being noticed as in somebody would notice it and not say anything. It was not getting picked up because nobody noticed something was... Because everyone was running around like headless chickens going through one sick patient to the next. It just didn't stop really" Staff Nurse, Critical Care, August 2020 "The speed in which we were expected to work. We had a lot of admissions very, very quickly." Staff Nurse, Critical Care, August 2020 "And everything had to be fast paced, but it was just a bit overwhelming." Senior Sister, Critical Care, September 2020 "During COVID, definitely felt the stress a lot more, and I guess you're a lot more aware of your environment because it's so crammed and all the PPE and stuff just makes everything so much worse. And you can't just nip in and out and go and get things I think" Physiotherapist, Critical Care, July 2020 "Suddenly all the ventilators got changed, the anaesthetic vents, which I had no training or ever seen before, and the patients were really sick." Senior Staff Nurse, Critical Care, October 2020

		"The skill mix also got worse because, obviously, we had so many people off sick" Staff Nurse, Critical Care, July 2020 "But then, I think when everything was at its peak, I don't know, everyone just felt very out of their depth. Managers tried to implement things, but they didn't really help, because it was unknown to everyone, what was going on." Staff Nurse, Critical Care, July 2020 "And then it was just that we often had more than one patient that was our responsibility, which obviously adds to the pressure." Staff Nurse, Critical Care, October 2020 "they're trying to do so much at the one time" Consultant, Critical Care, September 2020
	Stress caused by frequent changes in policy and protocols	"I think the morale is starting to drop a bit because no one can really work out these pathways. So now everyone's being treated as a red even though you know that they possibly don't have COVID." Staff Nurse, Critical Care, October 2020 "They changed 20 minutes ago, and they're going to change in another 20 minutes' time. That was difficult I think for them." Senior Sister, Critical Care, July 2020 "So, I think they start off quite a high level of PPE and I know that, whenever they tried to decrease what we wore, people weren't very happy. And people always assumed it was driven by supplies, rather than safety considerations, no matter how much you were reassured." Physiotherapist, Critical Care, September 2020 "specifically now, given Covid, I think a lot of the stress is a lot of emotional, people's anxiety, meeting expectations, currently having to just be able to adapt all the time, every time there's a new guideline." Registrar, Emergency Medicine, July 2020 "all the planning around Covid was incredibly stressful for me." Senior Physiotherapist, Critical Care, July 2020 "What was good management this week would probably been seen as not very good management in two weeks' time. That's what, I think, was very stressful and difficult" Consultant, Critical Care, July 2020 "currently having to just be able to adapt all the time, every time there's a new guideline." Registrar, Emergency Medicine, July 2020 "Every day there's a new rule, there's something new added to the system, so we just have to adjust and play ball, and even if we don't really agree with it or see eye to eye, that's what the powers that be have in place, we just have to go with it, for the bigger picture." Registrar, Emergency Medicine, July 2020

		"I think we had quite short notice on everything, like everybody did, so getting all the policies and procedures through" Senior Physiotherapist, Critical Care, July 2020 "That totally restricted us from our normal way for doing things, a lot of the coaching that they need to have done as part of the GPICS guidelines." Senior Sister, Critical Care, September 2020

Appendix 11. Topic Guide for Qualitative Interview – Working environment of hospital managers.

Exploring the Working Environment of Hospital Managers: Stress, Stereotypes, Resilience and Psychological Safety

IRAS Project ID: 292036
Version 0.3 07/12/2020

Welcome

Introduction & Overview

- Introduction of researcher and brief outline of project aims
- Plan for Session
    - Interview & short written survey
    - Expected duration 30 - 45 minutes
- Explanation that the conversation will be recorded, explanation regarding data handling and anonymisation of written transcripts
- Informed consent to be taken, with review of PIS. Opportunity for participant to ask questions. (If interview taking place virtually, participant will be emailed consent form and asked to sign & email back to interviewer at the start of the interview).
- Confirm participant is happy to proceed
- **"Please feel free to ask questions at any stage"**
- **"I may take notes so that we can return to a topic later in the interview"**

"We will now move onto the interview, which will explore your experiences working in a management role within the hospital"

Interview

What does your role as a hospital manager consist of? What are you responsible for?
What do you enjoy about working in hospital management?
What is your background? (Clinical vs non-clinical)

Participants view of the clinical environment they manage:

- Explore working relationship with clinical teams
- Explore any perceived difficulties in these relationships
- Explore presence of stereotypes
    - Participants impression of medical professional priorities
    - How do they feel their physician and clinical nursing AHP colleagues view them?

Ease of implementing change

- **"Do you find it easy to identify areas where change is needed?"**
- How easy is it to initiate change?
    - If barriers found, go on to explore these
    - Explore the factors which help facilitate change

- Are you satisfied you can achieve what you intend to within this role?

Psychological Safety

"Do you think the clinical team you manage find it easy to raise concerns / ideas?"

- Do you think this is beneficial? Are there any negatives?
- What do you do to promote this environment?

"Do you feel able to speak up to those more senior than you within your management team?"

- Explore experience of dealing with senior management expectations
- Explore if they feel their concerns are acted upon
- Explore opposing challenges: financial vs patient care; organisational change vs patient care
- Explore Resilience
    - Do you find it easy to work in the face of the challenges you have mentioned?

Influence of background

- Reflect back on difficulties raised in earlier discussion
    - Does your background have an influence on this?
    - Do you think your clinical / managerial background affects your outlook and priorities within this role?
    - Do you see others with different backgrounds facing different challenges?

Closing comments

"Is there anything I haven't asked you about that you feel is important or a source of stress in your working environment?"

"Now I am going to ask you to complete a short 13 question survey, which covers two topics – resilience and psychological safety."

(See below for survey questions – if in person can hand paper to participant, if virtual can share screen and ask participant to complete electronically)

Once survey completed:

- Provide opportunity for any questions or further discussion
- Provide participant with the following information
    - If you wish to follow up any issues you have talked about, you can contact us (provide contact information)
    - They are free to withdraw from the study at any point and their data will not be used

Thank participant for their time.

Appendix 12. Quantitative survey housing assessment of Psychological Safety and Resilience.

Imperial College Healthcare NHS
NHS Trust

IRAS Project ID: 292036
Version 0.2 07/12/2020

Quantitative Survey

Thank you for participating in this survey. There are 13 stems below – please state your agreement with each one (from strongly agree through to strongly disagree by marking the relevant check box.
If completing electronically - once complete please save the document – it will automatically upload back to MS Teams
If completing in person please return to the researcher once done.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I tend to bounce back quickly after hard times	☐	☐	☐	☐	☐
I have a hard time making it through stressful events	☐	☐	☐	☐	☐
It does not take me long to recover from a stressful event	☐	☐	☐	☐	☐
It is hard for me to snap back when something bad happens	☐	☐	☐	☐	☐
I usually come through difficult times with little trouble	☐	☐	☐	☐	☐
I tend to take a long time to get over set-backs in my life	☐	☐	☐	☐	☐
If you make a mistake on this team, it is often held against you	☐	☐	☐	☐	☐
Members of this team are able to bring up problems and tough issues	☐	☐	☐	☐	☐
People on this team sometimes reject others for being different	☐	☐	☐	☐	☐
It is safe to take a risk on this team	☐	☐	☐	☐	☐
It is difficult to ask other members of this team for help	☐	☐	☐	☐	☐
No one on this team would deliberately act in a way which undermines my efforts	☐	☐	☐	☐	☐
Working with members of this team, my unique skills and talents are valued and utilised.	☐	☐	☐	☐	☐

Appendix 13. Qualitative data supporting the thematic framework exploring stress in hospital managers.

THEME	SUBTHEME	SUPPORTING DATA
INFLUENCE OF BACKGROUND	Non-clinical vs Clinical Background	"No, my background's clinical…I do think some of my management colleagues who have come up through the management training scheme dispute this, but I think we do make, not better, but different general managers when you actually have been clinical. I think that's invaluable." *0095, General Manager* "For me, it is because, basically, it's quite interesting because I think I've got more empathy for them [*clinicians]*. I understand things much more. I can… But with the nurses, because I'm a nurse by background, I'm much harder on them because I know when they're pulling the wool over my eyes, you know, about staffing levels or something. But I think you get more credibility when you've got a clinical background, but I think a managerial structure should, have both, people with non-clinical and clinical backgrounds, yes." *0104, General Manager* "I think so because I think it's really good that they do have it. They have a better understanding of the patients, and the patient's needs and what you are up against with your theatre lists as an example if they know what the procedures are. Yes, just even understanding the patients, particularly MDTs and that sort of thing. I think it's good to know." *0114, Service Coordinator* "I think it definitely makes a difference, having that clinical background, and certainly in terms of interaction with clinical people. I guess it's that whole thing, do you have to have had a baby to be a good midwife? I don't know, but it really helps. Because I see my job as being able to provide the teams that I work with what they need to be able to look after patients well" *0116, General Manager* "I find that easier, because I've been an intensive care nurse, and I know how to challenge a clinician about something because I've had to do it all my growing-up life, whereas I think some of the less experienced staff might find that quite hard. And then there are specific corporate people who just want to please their line managers and don't push." *0116, General Manager* "I'm really, really fortunate that I came through the [Company] management training scheme. But you're taught to be a leader, and leadership skills. You are not taught to be a manager. You're not taught your really good skills in terms of any economic associated skills in terms of being able to write a business case, manage financials, have really good decision making, balance risk." *0105, General Manager* "In our division, there are two sorts of general manager. There are those that have been clinicians, clinical staff who've come up

		through the ranks, if you like, and then there are the… Or three maybe. And then there are the graduate trainees who are younger, and they have a completely different operating style to us gnarly old people, and then there are the people who have been in the NHS a long time but have come through the administration kind of route. There are three different types" *0116, General Manager.* "Those that have a clinical background just have a different way of viewing things, I think. My approach is probably more structured, probably more focused on data and analytics." *0103, Hospital Director* "I understand their perspective and what goes on a little bit more on the shop floor maybe than perhaps some of the managers that come in who've just come in at that management level." *0117, Service Coordinator* "I see these young whippersnappers coming off the scheme and they're fast-tracked into management, and it is all about the business and the money but forgetting sometimes what we come to work to do. And that's to deliver healthcare and high-quality care, I think." *0095, General Manager* "We've got quite a lot of senior people and a lot of them have got clinical backgrounds. But it's really quite interesting when you see the way things might get set up when a non-clinical person has done it as opposed to a clinical person." *0098, General Manager* "And the people that really stand out are the people that seem to have this amazing talent to remember stuff and be able to talk with confidence about stuff like clinical services. But I'm a bit like how do you even know what goes on in that service? Yes, and I think the people that do it well are the people that just seem to be able to assimilate that knowledge really, really quickly." *0098, General Manager* "I think it probably largely exists in our heads rather than in reality. So the people who come from clinical backgrounds will very often be like, well I'm a nurse and so I'm only interested in the patients and that's my main focus. And that just really pisses people like me off, because I could have an easier life and be earning more money doing something else, but actually, that's my focus as well." *0100, Divisional Director* *"*So there's a bit of a skill set I think you learn, which is, we're not to get involved in things. And sometimes you get that wrong. And the people who are former clinicians feel that even more because they can go and do really practical stuff, be helpful with" *0100, Divisional Director*

	Significance of background on ability to perform role	"I think what's useful is to be able to troubleshoot stuff. I think what's useful is that I can have a conversation with someone that can get into a sort of clinical reasoning prioritisation, because I've been doing stuff like this for a long time. That is the useful bit, I think. And I think, generally, people treat you differently if they know that, actually, you have been there and you have seen some of it" *0094, General Manager* "Yes, I do think so because, I can say, yes, I actually do know what it's like, albeit 15 years ago when I was clinical, but you never forget those things. I always say I'll never make a decision that's detrimental to the patient. That's not what I'm about. But sometimes I have to say we can't afford It, but we can look at doing something this way and maybe save the money that way…..You never forget that clinical background. It's always there, and it shapes your decision making, I think, a bit subconsciously." *0095, General Manager* "Yes, definitely. And especially some of the other things that we've taken on. For example, we often will get asked to help investigate or support a serious investigation or we'll be involved in audit. And it's really, really good to have the clinical background to be able to do stuff like that easily" *0098, General Manager* *"*I think that definitely being clinical helps, really, really helps, because I think it gives you also just some of that… Just the physiology and things like that, you understand that a little bit better when people are trying to explain stuff to you. And I just think that it really helps. I think it makes you more relatable." *0116, General Manager* "And a manager who comes in as manager will be much more focused on maybe various outcomes but not necessarily on how to resolve things and get there in a way that works for the team or they'll do it in a different way. But I think strengths of the NHS is the variety of managers that you've got." *0107, General Manager* "I think people who are former clinicians who go into management management, they're not ward managers or matrons, but my kind of role, I think they do lean on it quite a lot and actually struggle to be like, actually, you're not employed as a nurse, you're employed as a manager and that's the hat you need to wear. I think there are differences. I think there are things that we are uncomfortable doing. So we're not comfortable doing that, let's take a step back and let's do that broader picture abstract bit." *0100, Divisional Director* "Because you don't have to be clinical to be able to understand clinical pathways. However, it does help with how you communicate with people. And if you're not familiar with the environment, there is always that oh my God, I'm talking to the consultant. Oh my God, I have to be really smart. Actually, you don't, because the consultants, like clinicians, they're only smart in the field that they're in. Outside of that, they haven't got a clue." *0099 Operations Manager*

		"And I think you need a mix, because we all need to be able to do all of those things, and you will always find people who are good at some and great at some and not so good at some others. And that's fine, we need that sort of broad spectrum. And I actually think clinicians who go into management, management, I imagine it's really hard for them. As a former service manager, your instinct is, right, I'm going to roll my sleeves up and I am going to go and I'm going to push some trolleys around. I'm going to pitch in and help out. You can't always do that in these jobs now. Not because you're not allowed, but because you might not have time or because it's difficult for other people who are doing it. And actually, one of the things which has been difficult for people I think to admit it, various senior managers getting involved in stuff, it often makes it worse. And it's often the doctors are perfectly capable of sorting the problem out, or they don't need someone like me showing up where they have to spent 20 minutes explaining to me what the problem is." *0100, Divisional Director* "So I do think my background probably puts me in a slight advantage over possibly other managers that are grad schemers maybe" *0102, Deputy GM* "I've got no business trying to leverage any clinical expertise, that's just not my skillset at all. And those that don't have a business background might not be so strong in business planning, but we can support each other, and peer challenge, and ask advice of each other, and it think that works pretty well." *0103, Hospital Director* *"*I would think there is an increasing convergence between managements and clinicians, because of being data driven. The data we're looking at, hopefully, is well-shared. So, if you think about it, we're trying to link both the clinical data, the access data and the financial data, so you don't have groups looking at different sets." *0108, Divisional Director* "I think some of our colleagues here have a nursing background who are also GMs, and they're great general managers, but I think the triumvirate works very well if you get one doctor, one nurse, and one manager, I think, because you all bring different perspectives towards the same goal. And I think if the triumvirate works well in cohesion, I think the success can be really, really incredible." *0109, General Manager* "Most managers you meet within the NHS now come through the NHS management programme and they're fast-tracked, if you like, and they often don't do those junior admin roles and work their way up. There are bonuses to that and I get that, but I think for me, what's quite nice is that I can really relate to a lot of my staff because I've done quite a few different roles and worked in junior roles." *0117, Service coordinator*

		*"*I think what you learn on those schemes and then you transfer them to reality, it's a very different thing. The cogs in the NHS turn quite slowly. I think they get very frustrated." *0095, General Manager* "I'd like to believe it allows me to have an unbiased view. It's not formed based on my own personal experiences of working within clinical areas. The flipside of that is really I have to rely on experts and try to interpret whether the experts are feeding me their priorities or the priorities for the specialities throughout the organisation." *0101, Hospital Director*
ROLE WITHIN WORKING ENVIRONMENT	Change – barriers and ability to effect change	"Depends what the change is. If it's within the directorate, it's quite easy to do" *0094 General Manager* *"*So we changed quite a lot of things here, since I've been here. Certainly a lot of fabric things have been changed. Some of the problems, the reticence to change was never that people didn't want things to be done, it was they didn't feel they could be done. And you just have to show people that they can." *0094, General Manager* *"*I think most of the time if you get the right people in the room, and they don't feel done to, that they're part of it, it, sort of, normally works." *0095, General Manager* "Oh, sure. You can, yes. You can make it the priority. So that means you have the power to do that. Because what you'll do is you'll stop something else to either invest or resource that, to make sure that doesn't happen. So those are the types of decisions." *0099, Operations Manager* *"*If it's internal to the trust and completely within your own sphere of influence, then yes. It's not without its technical challenges with HR and all of that, but once you understand the process, and of course you engage people both hearts and minds and their own change. Technically speaking, it isn't that difficult to achieve, providing it doesn't cost you a lot of money." *0103, Programme Director* *"*Sometimes it's knowing who to talk to, and I've been here for such a long time I know most people in the trusts, so I can quickly resolve things, or they resolve them for me pretty quickly." *0104, General Manager* "That change has to be driven in one way, and everybody needs to be on board, so I just need to manage noise there and to manage anxieties." *0109, General Manager* *"*You can create your own pathway, a bit of work with it to make it better, if you see something to improve they will follow it." *0112, Service Support Manager*

		*"*it was about really getting some champions on board, and just almost circumventing the sort of professors that had been here for donkeys' years and didn't want to change. And that was quite tricky because people were very loyal to them. But they were working in quite antiquated ways." *0095, General Manager* *"*The difficulty for me is, again dipping on the external interface, is that my finances and my director of influence are completely bound up with other organisations. So, my ability to say change the discharge function. I've got to consult in quite a complex web with lots of other external organisations that have their own budgets, and their own drivers, and their own pressures, and their own staffing concerns, and their own HR processes, that's extremely complicated. But it's not impossible." *0103, Programme Director* "Or you've got a big project and you're dependant on other people actually. Sometimes that's frustrating because they're not working to your timescales; they're working to very different timescales, as such." *0104, General Manager* *"*Now I'm not saying that you shouldn't have governance because you should but if you put in a layer of management to deliver something and what they actually do is talk to staff on the ground and actually waste their time. So they talk to the staff about something that the staff know and they're forever talking to staff and forever talking to staff and then you've got somebody else that does the same thing, it just elongates every process that you're doing and people get tired of that." *0107, General Manager*
	"Helicopter" view of working environment	"The clinical direction I do more than strategic stuff. So, we're doing the really big, sort of, stuff where we're constantly having this helicopter view" *0095, General Manager* *"*And I think that's, in some ways, you can't criticise for them for that because they're only seeing the bit they see… And our job is to have that overarching responsibility and accountability, but sometimes it's a bit difficult to explain that maybe you're not the priority" *0095, General Manager* *"*And ultimately, I came in on that and just like, this is what I see as the overall piece. So, if this is the overall piece, which way do we go to get to an outcome and an answer without directing people as to what to do. But just say, look, I understand what you're saying, but I'm not just thinking about this bit that goes from here to here to here, I'm thinking about this bit, so I want this to go from here to there" *0096, General Manager* *"*I think my job is to make sure people are aware of those [unclear], because that's their role. So my job is to make sure that level of communication does pass through, so there's awareness and empathy. To empathise in a way that this doesn't stop here. So if I'm going to do something now, it could impact somebody else down the line. Just that understanding the whole journey" *0099, Operations Manager*

		*"*So, I think my role, ideally is to bridge those divisions in the speciality discussions to make sure that what is optimal to one service is actually not having a detrimental impact on another and vice versa" *0101, Hospital Director* *"*I think that's often when I see conflict is. I'd see it so often and so clearly, of someone comes from it from one side, and they see their bit of the world, and they see it as really simple. And someone's from the other side, and see their bit of the world, and it's so complex, so how could you do it? That's pick up the feather and just lay it all out. You want to solve the problem relatively easily" *0105, General Manager* *"*Yes, I think you have to remind people of the things they need to know, like that. They might say, why don't we do it this way? And I can say, well, the thing you need to know is, this. Why can't? Well, there's actual money and there's revenue money, and it's trying to explain to people whey they can't just spend capital money." *0106, General Manager* *"*it's that overview of the whole service" *0096, General Manager* *"*So, basically recognising that each of our three, four sites have got different cultures, different priorities, different focus areas. And recognition that it needs a leadership team that have got responsibility for knitting and gelling all of the specialities that are on a specific site." *0101, Hospital Director* *"*So, I think my role, ideally is to bridge those divisions in the speciality discussions to make sure that what is optimal to one service is actually not having a detrimental impact on another and vice versa. And ideally, we've got a win-win with decisions that are being made at a local level." *0101, Hospital Director*

	Role as facilitator	*"*Actually, a lot of the first intro is trying to convince clinicians, nurses, AHPs, whoever, that actually, I do care as much about patient care as they do. I've just got a different role which is more of a facilitative role rather than an actual caregiving role." *0113, General Manager* *"*So, divisional or wider organisational meetings where you're representing your whole service, whether that's nursing, medical, whatever function you're representing, that articulating the passion, or the energy, or the frustration that they have into an appropriate way to share that message, can be quite difficult" *0096, General Manager* *"*I suppose that it is a bit of managing unrealistic expectations about how quickly things can be done or actually what we're trying to improve doesn't actually sit with us. We're an enabler but we don't make it happen." *0098, General Manager* *"*, I think my role, ideally is to bridge those divisions in the speciality discussions to make sure that what is optimal to one service is actually not having a detrimental impact on another and vice versa" *0101, Hospital Director* *"*Well, they don't know how to access the organisation. I think that's what I'm improving. I understand who you've got to go to and how you will block things. I very much see it as my role, as helping to unblock things for people so that they can go and do what they want to do." *0105 General Manager* *"*Doctors are obviously really, really clever people, they know their services really, really well, and I see myself as more of a facilitator sometimes in terms of trying to do what they want me to do." *0117, Service Coordinator* *"*I see my role as being able to facilitate some resourcing that they need to be able to do their job, that's a very big part of my role" *0116, General Manager* *"*I think, also, there's a view that it's my job to do it for everybody. Whereas, actually, for me it's about empowerment and self-education. I'll say, okay, well, I'm not going to do this because, actually, we need to get clinic space. Or, you've another manager I can ask, can help you." *0105, General Manager* *"*You do have a lot more exposure, because there is a lot of… Everyone's looking at you to be able to help them deliver their service. We're in quite a unique position in terms of how we network with other people and try to help them in the form that they need to deliver on their targets effectively." *0110, Business Manager* *"*And I also found that clinicians, when they all complained a lot, if I sit and I give them all of these explanations, they will go away

		and find a solution themselves. They don't necessarily want me to resolve the thing for them. They just want that permission" *0105, General Manager* "So my job is to make sure that level of communication does pass through, so there's awareness and empathy." *0099, Operations Manager* *"*I think there's a lot of me, the peacekeeper, and keep people calm, and do that." *0102, Deputy General Manager* *"*I think, upfront I usually say, look, my deadline is X, and probably yours is Y, but if we can try and meet in the middle and understand where I'm coming from, so explain to them why because I wouldn't just have a deadline for a deadline's sake" *0104, General Manager* *"*I'd see it so often and so clearly, of someone comes from it from one side, and they see their bit of the world, and they see it as really simple. And someone's from the other side, and see their bit of the world, and it's so complex, so how could you do it? That's pick up the feather and just lay it all out. You want to solve the problem relatively easily." *0105, General Manager*

THE PRESENCE OF STEREOTYPING	Presence of stereotyping and persistent stereotypes	"But, yes, it does my head in when they say the managers, and they're like, right, yes. It's a massive term to use, isn't it, in the NHS because we've loads and loads of different managers." *0095, General Manager* "So, clinicians will think, oh, this is about, to make them all balancing the books. Whereas, actually, it's a real opportunity to set out what you want. Any business plan is about what you want to do. What you want to do on behalf of your patients and your people, and what that means to your bottom line, in terms of money." *0108, Divisional Director* "They also look at you a bit in terms of your age as well. I think if you're seen to be a young manager, they automatically assume you're not going to really be around for very long. I think that also is a bit stereotypical. And I think there's always been… I do feel that sometimes there's… There's always been a bit of a strained relationship, I think, with consultants and managers in the organisation." *0110, Business Manager* *"*I think the doctors know that I'm like that, now, and I won't be pushing things just for the sake of it or just to hit a target, that I'm a bit more pragmatic in that approach. But I think anybody coming in new, yes, I think they are very cynical and just think, oh, they're only interested in hitting their goals, and we're interested in our goals, and never the twain shall meet." *0111, Business Manager* "The NHS is charged with making cost savings every year, it's a political thing. It's not a thing that managers want to do but it's viewed as something hospital managers want to do." *0113, General Manager* "I think that there's definitely something in that. It's not completely unfounded" *0098, General Manager* "Most people, when I did it, were, like, oh, you're going to the dark side of management." *0095, General Manager* "But there was definitely an element that they'd already decided that there was a bit of corporate services that don't really do any work compared to the people that are really doing a lot of work on the ground." *0098, General Manager* "I do think we are perceived in that stereotypical way, yes." *0110, Business Manager* "Yes, I guess so. I am not too sure. I think yes, you just have to be very focused. It seems very target-driven. I think there is that stereotype there. I would have to agree with that." *0114,* *"*Do I come up across that stereotype? Yes, I do from the clinical point of view sometimes. It's harder for them to see beyond

		what's just happened in their clinic, what happened when they were attending last week, and can't see a bigger-picture view of how we might change something to make them feel better about how they're practising." *0116, General Manager* *"*Quite a lot of cynicism in some teams about, well, let's try this, oh, trying something, we know it's not going to work, da-da-da, all that the trust cares about is money, it doesn't care about patients, says it cares about patients but doesn't really care about them. I do see some of that, but then, saying that, there are other clinical staff who I'm surprised at how interested they are about what goes on with the finances, what that means." *0116, General Manager* "It feels to me though, that as my career's gone on, I come across the stereotype less and less" *0100, Divisional Director* *"*My personal view is it's slightly outdated." *0101, Hospital Director* "I think it's really outdated. Because actually if people know my role, I know all the risks on our risk registers" *0102, Deputy GM* "I think it, in the main, it is outdated now" *0103, Programme Director* *"*I think it's more outdated." *0104, General Manager* *"*There are a few traditional managers around who will say, well, basically, you know, if a clinician said I need X, Y and Z, they'd say, no, no money, whereas a lot of us are very much about let's work this through, let's see how it can, even if it's an averse [unclear] see how we can try and make it work. So, I think gone are the days where there was the traditional, kind of, finance pay-at-the-month-end managers rather than just clinicians as well." *0104, General Manager* ", I think they're, well, I would hope they're outdated." *0108, Divisional Director* *"*So, my view is, it is outdated, but perhaps not as outdated as I would hope. My experience has been, and what I have fostered, hopefully, has made it outdated." *0108, Divisional Director* "I hope it's outdated, and it should be outdated, but I know lots of my colleagues who are managing exactly like that, general managers who won't get involved in anything that doesn't have numbers next to it" *0109, General Manager* "So, we worked quite closely alongside each other since the day I got here, and one of the first things he said to me was,

		management never stay. This is a consultant-led kind of environment because management just don't stick around. If I don't get on with management, I'll wait until they disappear, and the next lot to come in in 18 months' time and we'll just carry on that way." *0096, General Manager* *"*I feel that also there is a bit of a stereotype that managers don't stay around for too long as well. I remember when I first joined, and I think there were a couple of times where something the director actually said to me, that, oh, have you got a plan for handing stuff over" *0110, Divisional Director*
	Reasons for stereotyping	"And one of the things that all of the trainees used to say when we went through, was that they didn't actually understand that managers really were there for the patients. They thought that they were purely there for money. And that's not the case." *0094, General Manager* "I know that there are general managers who do not get involved in anything that is not numbers, and everything that's clinical or safety-wise, they will just push back." *0109, General Manager* "But people only see the hospital manager group rather than the overarching groups. Then if you look at management costs as a whole it feels the public perception is well, there must be so many managers in hospitals." *0113, General Manager* *"*I think the reality is, and a massive issue, something that I would like to go on to do in a later career, is actually, it starts with education. And, if you look at the medical training, you're taught to be a doctor….Yes, so how can you then turn around and say, well, they never get involved, when you've not even been aware of this whole other world that exists." *0105, General Manager* "But if you are a doctor or you're a consultant and you have a really bad experience with a manager, you might only come across a couple more managers in your life. It's not inconceivable in some organisations, that every single one you come across doesn't care about patients, because in lots of ways, lots of doctors don't care about patients really. Lots of managers don't really care. I think a lot of them have had this experience, they've passed that experience onto their teams and then breaking that down can be quite challenging." *0100, Divisional Director* *"*People will introduce you as, oh, you need to speak nicely to [Name] because she's the one with the money. And I think, the other thing, the one thing, I'm pretty even tempered. I'm experienced and I'm even tempered. I don't tend to get excited about stuff. The one thing that will always rile me, is when people tell me how they care about the patients, as if I don't." *0106, General Manager*

		"So, I think, yes, that we do come across it a lot. And, you almost have to make more of a deal of it, because I think people expect you just to be interested in money. But of course, if you look after the money, we can provide care for more patients. So, yes, actually I'm worried about all the patients." *0106, General Manager* "one of the reasons is that they're patient focussed, whereas we're money focussed or finance for me driven, focussed." *0110, Business Manager* "I think it's this sort of generic term which drives me mad because I'm saying if I haven't done something, tell me it's me, the general manager. But often it's like when you drill into it, it might be, like, the bureaucracy that's stopped them doing something. It's not always me, but it is, some of the processes are bureaucratic, and that frustrates them." *0095, General Manager* *"*But I think that's people not understanding we're responsible for the governance, we're responsible for the quality and safety. It's a lack of understanding." *0102, Deputy General Manager* "Yes, a lack of understanding and a lack of education." *0105, General Manager* "And that's the issue that some have where their manager's always looking at it at a macro scale and the individual clinician over 20 years perhaps of fellowships and research years and core training is all focused on how do you actually do the surgery? How do you do the…? And that's real imbalance and it's only later on down the line that it appears that goals are not aligned. The goals are aligned it's just two different lenses that you have to look through." *0113, General Manager* "I think everyone thinks that what I do is really easy. Some of the clinical staff that I work with, they think, oh, what does she do all day? That just shows a lack of understanding, and sometimes when you're challenging back about some of this stuff, I think they find it really quite hard." *0116, General Manager.* "Then your clinicians worry that managers come and go. They're there for two years. It's one of the big concerns. If you listen, speaking to them, they're there at the start of the business planning cycle. They're never there at the end. They're never at the start and the end of a business case." *0108, Divisional Director*
	Influence of individuals	"On the clinical side, I think it really varies. I think there are some clinical directors and [unclear] in clinical leads departments [unclear] who are very switched on to the business side of things. And because they're genuinely interested in it, or they're

	priorities – financial vs clinical	confident talking about that kind of thing. I can see some who have risen to great heights who have no interest in that area and their general managers compensate for them." *0103, Programme Director* Some of them [*clinicians]* are quite selfish and throw their toys out of the pram, asking for something for themselves rather than the team. But you can read them a mile away." *0104, General Manager* *"*Whereas, not that you're not, as clinicians. But you're worried about the patient in front of you at the time. Or, your group of patients. Whereas, I have to worry about a big group of patients, and making sure that our consultants have what they need, and all the rest of it, to look after them." *0106, General Manager* "I think the consultants are more interested in the patient, absolutely and they don't want to learn about finance but they recognise that finance is there but they expect somebody else to deal with that." *0107, General Manager* "But overall, I think financially, everyone knows we are financially driven. Our decisions are often led by the financial ability to what we have. And also, it's also balances on the types and numbers and complexities of patients." *0099, Operations Manager*
WORKING RELATIONSHIPS	Building and maintaining working relationships	"Potentially, that's something that maybe is drilled into us from a graduate scheme, because you have to have, you've got a mandatory one-month orientation period at the beginning of your scheme. So, I applied to spend time to clinically. I would work in quarters. I was in the kitchens. You really get to know the bowels of your organisation and how it's run." *0105, General Manager* *"*I think if you come into it just looking purely at the finances and don't do that, then you don't then get… You really do need those working relationships. And that's something that I'm always really keen to do." *0117, Service Coordinator* "So, I'm really open and honest with my clinicians, and we share, I share everything. I say there are no secrets, and the budget is the budget. If we haven't got the money, we need to work out how we get it. We write business cases together. So, I'm really transparent because I think it's a much better working relationship." *0095, General Manager* "I used to as a much more junior manager, but not so much as I've got more experienced because I think you have to very much work together. It doesn't really work if I'm always talking about the money and they're always talking about quality care. You have to really work together, and, you know, you have to educate the clinicians about the sort of budgets and that there isn't a bottomless pit of money." *0095, General Manager*

		*"*Managers come and go, but the clinicians tend to be there for a long time, and it's their service and they're the ones that are usually really passionate about it. And you really have to build your relationships with them in order to really drive through the changes and the improvements that you want." *0117, Service Coordinator* "So, I would never go out and say no, I'd always have a caveat behind that, or sit them down and say what's your rationale. So, we work together to try and achieve it. Yes." *0104, General Manager* *"*So, you have to work alongside each other. We definitely have times where we don't always agree. But we work through them" *0096, General Manager* *"*I think that there is a recognition that from a whole system perspective, certainly that we have here, that there's a mutual respect and admiration, I think, from the management, and the clinical, and the nursing side, about how we've all got our own way of being involved to run the directorate as a whole." *0096, General Manager* *"*I have really, really good relationships with the clinical teams. I think they're only key people on. You don't really see everyone. But I'll have contacts with the clinical director every day."*0102, Deputy General Manager* "Because I've always had really great relationships with my clinicians. I'm not sure why that would be the case, but I think it's really key. My portfolio is everything. I think, for me, the first rule of business is, know your business…..And, I think that's really key. And just that then, trying to find common ground and shared understanding, is essential in terms of building relationships, but also being able to manage any portfolio that you're responsible for." *0105, General Manager* *"*Something that I've learnt, I suppose, from being a manager is to really, really work with your clinical team and get to know them first." *0117, Service Coordinator* *"*So, everyone has their own priority and when you're a manager who is a support service manager you've got every other area in the Trust and outside of the Trust who think their individual patient is the highest priority there is ever. So, managing expectations and managing the whole communication chain is quite important." *0107, General Manager* *"*I'm really open and honest with my clinicians, and we share, I share everything. I say there are no secrets, and the budget is the budget. If we haven't got the money, we need to work out how we get it. We write business cases together. So, I'm really

		transparent because I think it's a much better working relationship." *0095, General Manager* *"*I've never, ever said to my clinical director, absolutely not, we're not doing that. I listen to him, and he'll guide us all the time about the right clinical decisions. I always say we're not in the business of making car parts, and it is healthcare." *0095, General Manager* "I think visible presence is important, probably you know what you're talking about is more important. But, or if you don't know what you're talking about, admit it and take advice from someone that does. But yes, I do think it's important." *0094, General Manager*
	Presence of conflict	"I think there is always conflict, but I think it depends on the culture that is around you or you've developed in the service that you're managing that says, do we let finance define what we do? Or do we let patients safety drive the developments and everything that we need to change or do or deliver in the service? But the financial is a big conflict area that we have to manage. The other area that I would say takes quite a lot of energy is managing expectations and setting expectations." *0107, General Manager* *"*it's going to be in relation to somewhat patient care or whether it's… One example is reverting from face-to-face interpreter to a [unclear] interpreter and see what savings are there, but then the quality of interpreting goes down. It's those kinds of little things that we would as managers be looking at, but someone clinical would say, actually not really in agreement with that. But those are the kinds of challenges that would be face to face" *0109, General Manager* . "So, I want to improve things for patients by using this. Well, there is no money to buy it, so you can't. Well, it doesn't matter. You can, you know. There's nothing you can do. So, yes, there is a conflict. Definitely. Definitely. But you could give the banks a try. You can get the banks to try at customer care. Kindness. All that. All that stuff. All that rubbish." *0105, General Manager* *"*I think there is always conflict, but I think it depends on the culture that is around you or you've developed in the service that you're managing that says, do we let finance define what we do? Or do we let patients safety drive the developments and everything that we need to change or do or deliver in the service? But the financial is a big conflict area that we have to manage. The other area that I would say takes quite a lot of energy is managing expectations and setting expectations." *0107, General Manager*

		"So if you want a job, you have to write a paper. It then goes to a divisional group, and then it goes to executive group. And then it goes to someone else. And this doctor didn't get why the process couldn't just be tomorrow." *0102, Deputy General Manager* "Whatever they have to throw at us, bad behaviours, capital letters, highlights, my job in their eyes is just to take that because they were upset at that moment, and I think they forgot that we're also people and that we have our own problems in our own lives" *0109, Divisional Director* "but it's just making sure you've got those good relationships up the line, I think, as well. You get the odd doctor writing to the chief exec, and then that annoys the chief exec. And then he writes back to you, saying you need to manage your doctors. And you're like, oh, God, it's not for the want of trying." *0095, General Manager* "The difficulty is obviously you get different opinions between doctors sometimes. That's quite a difficult line to manage sometimes, but it is really, really key, those working relationships," *0117, Service Coordinator* *"*as a junior manager, there's very little respect, certainly from senior clinicians, as to what the role is or what value that it adds. It's a means to an end." *0096, General Manager* *"*If the clinicians wanted it changed, they expected it to be changed, regardless of what the principles were about any of it. And they were just talked down to to do what was asked, because we're the clinicians and you do what we asked" *0096, General Manager* *"*And that frustration gets vented towards operational managers……That never goes well, because then, it becomes oh, you don't care about us, you promised us this. And oh my God, you've failed us." *0099, Operations Manager* *"*Sometimes you get consultants or nurses who, sometimes due to an experience or sometimes due to frustration, feel that it's the wrong decision. And clearly trying to manage that reaction is sometimes tricky. But I think to a certain extent it goes with the turf, unfortunately." *0101, Hospital Director* *"*Consultants think that they have a right to write an email with capital letters, underlining letters. I get an email with capitals, underlined, and then highlighted…" *0109, General Manager* "But that I think it's a bit of a challenge where you're having to deal with a hugely intelligent group who won't respond well to

		authoritative leadership styles. Because they go, well I'm internationally known for this and who do you think you are? Whereas if you can have a more influential and at times even coaching when it comes to management aspects, you can either help them see your point of view or give a bit of a softer blow. But these people are your… I view them as colleagues, but there are some managers who don't, but I do." *0113, General Manager* "But on the odd occasion, I have to step up and say, right, I'm really sorry, guys, this is the decision we're going to make, but I find most of the time you can come to the decision together." *0095, General Manager*
	Working in a triumvirate	"Because I think it's good to have three different views, and sometimes we go too much with patients, patients, patients, and it's absolutely in the centre of everything we do, but it's also being reasonable with it and what is reasonable and not." *0109, General Manager* "I've always worked as part of a triumvirate in a division. So, there's always been me, a divisional director who's a manager, and then a clinical director who's a doctor. So, we've always worked quite closely together." *0098, General Manager* "it's normally been built around the triumvirate, as [Company] has. Because normally there's a lead clinician, consultant, doctor, and there's normally a lead nurse. And those three together I think how they interact and how they work together forms the baseline around how the whole directive works." *0101, Hospital Director* *"*I don't know if I've just been fortunate. My experience has been those three have always worked quite effectively." *0101, Hospital Director* *"*I don't know if I've just been fortunate. My experience has been those three have always worked quite effectively." *0103, Programme Director* "We had to do a very big piece of work together to find where the best strengths of collaboration was. And, I would say every triumvirate has to do the same." *0108, Divisional Director* "The interesting one, back in it, we don't recruit triumvirates as in, trying to consider what that team skill-base is, and it's something, I think, we should do more. We should really consider, in terms of, what is the fit? Our recruitment strategy shouldn't

		be just based on the job description. It should be based on what that team-based skill base is, and what is it we need for that next two to three years" *0108, Divisional Director* *"*I think the triumvirate works very well if you get one doctor, one nurse, and one manager, I think, because you all bring different perspectives towards the same goal. And I think if the triumvirate works well in cohesion, I think the success can be really, really incredible." *0109, General Manager*
PSYCHOLOGICAL SAFETY	Perception of own Psychological Safety	"Yes, definitely. I can raise them to our divisional leads. And by the time I've got a problem, I imagine it won't be unique. Because if I'm facing it, it will be something that's already filtering through. So the first thing would be to check that somebody else had this problem. Oh, maybe I could have learned before escalating. So there's something you can do for yourself first, is to check. Because at the end of the day, it doesn't matter which service you're in. As a general manager, you will be dealing with similar things in different ways as your counterparts and colleagues as well. So there's definitely a shared learning there. But yes, I can raise concerns, issues, just a white flag if it's getting a bit too much at any time." *0099, Operations Manager* "And you feel much more comfortable owning that you don't know. I think you learn a little bit about your audience and who you would go to with what." *0100, Divisional Director* "But I would talk to my immediate boss about it who's also an executive, and I would feel comfortable putting my hand up in a big executive meeting saying, we need to remember this and what do we think about that. You just sort of get better at being your own internal filter a little bit, about what you do and don't bring." *0100, Divisional Director* "And both of those individuals I've got full confidence in, which does make my position healthy and strong I think in terms of whether I feel comfortable speaking out." *0101, Hospital Director* "I feel comfortable with raising them. I don't know if they'd be acted upon." *0102, Deputy General Manager* "I did have a serious concern that needed executive input, I would go via our divisional representatives, who are great." *0103, Programme Director* "I think it depends which executive you're talking to. If I wanted to raise a concern, yes. if I wanted something done about said

		concern, that responsibility firmly sits at my feet." *0105, General Manager* "I've learned that there is, probably, over time, there's probably ways to do it. So, I think you have to, when you're in these big organisations. What am I saying about this? What do I think? I think you have to make a determined effort, sometimes, actually. It's not an easy thing to do. In that context, if you can make a determined effort, then it doesn't feel like the safest thing to do, is my view." *0108, Divisional Director* "No would be the answer, but that's not because I think I'm going to be fired or I'm going to… Nobody's going to do anything to me, if that makes sense, if I speak up. It's not one of those things like somebody's going to fire me." *0109, General Manager* "I think within our own team, yes, I would be comfortable raising it within our own team, but I think maybe more at a senior level, probably not, because I think within our team, it goes as far as our team, but then I don't think maybe further than that." *0110, Business Manager* "So, on the whole, it would be with my direct line manager, but I have been involved, occasionally, with the execs. I wouldn't feel quite so comfortable in raising difficult issues there" *0111, Business Manager* "No, I don't. It's a bit tricky. I think it depends on the person" *0114, Service Coordinator* "Yes, I would do. I think it's really important that everybody, no matter what their role, feels that they can have a say and can have an input and make changes. Yes, it's something I would be really keen to do." *0117, Service Coordinator* "I suppose I've probably got confidence from having been in the NHS for quite a number of years to speak up, and I certainly wouldn't worry about voicing concerns. I think, yes, I would feel comfortable about having those conversations, and if I had things that worried me, then I wouldn't feel that I couldn't approach senior managers about it" *0117, Service Coordinator* "No, I think I'm going to continue to do it. Because the way I think it's right to continue to raise it. But I'm realistic around there's probably nothing that's going to happen from me doing this." *0102, Deputy General Manager* "Yes and no. I know that even if I will speak up nothing will be done. So, there's no point of doing it." *0112, Service Support Manager*

		"But I think there's a deep-rooted feeling, for me, is that I will never escalate anything. And that could be me. It's not because I can't. It's me." *0099, Operations Manager* "And I'm trying to make suggestions to my line managers, and they don't want to hear those because that's too hard" *0116, General Manager*
	Barriers to Psychological Safety	"I won't escalate anything unless I completely try to fix as much as I can of it first. Because you never want to be the one who just passes on the problem" *0099, Operations Manager* "I think it's quite tricky outside of that. I would worry about things people say politically. I think there's been a couple of incidents where someone said something innocently. It was meant well. It was a good idea. But depending on who you are around, and who it was said to outside of [department] it's come back to bite us a few times." *0102, Deputy General Manager* "It's difficult, you can't just go and drop by people's office anymore and the big group meetings, obviously, are no longer possible in the same sense. And those informal interactions where you can voice a concern are impossible to achieve really anymore", *0103, Programme Director* *"*Rather than asking me is there a problem, what are you doing about it, how are you managing it, I was told, there is a problem and it's your fault. Now there is no psychological safety in that environment" *0107, General Manager* "So, it didn't feel you could hear everybody's voice in there. And actually, it didn't feel psychologically safe. The fact that you have 40 people in. There's no way. You don't know them all, actually. So, I feel it is the numbers." *0107. General Manager*
	Organisational Culture and Hierarchy	"No, not really. And I think that's quite common I'd say at the organisation that people don't feel comfortable about that." *0098, General Manager* "With my own divisional structure again within the last couple of years, the divisional team have definitely tried their hardest to create a place where people can bring their concerns and be themselves." *0103, Programme Director* "In this trust, it's much more difficult." *0116, General Manager*

		"I think there is still a bullying culture in my environment from the team above me and I see it or hear about it a lot. That's not good either." *0107, General Manager* "I don't think that there's a strong culture of standing up and saying this isn't right or I don't agree with it or is there a better way of doing it." *0098, General Manager* "I don't think the culture's there at all. And I think that you definitely see a lot of bad behaviour. And, yes, we've done so much work around culture and behaviours and values, but it just seems ingrained in some people that they just fake it for whatever purpose that they need to. But actually, deep down they're not going to change." *0098, General Manager* "A lot better than it used to be. I'd say there's been a kind of cultural shift in the last five to ten years. It's still not perfect, but it depends on who you talk to how receptive they are. But, generally, I think there's much more willingness to listen at least. Yes. there's been a sea change, yes." *0104, General Manager* *"*I think it's just a real, acute trust culture, where you think, if you speak out, that'll be it. You'll be, you know. Just get on with it" *0106, General Manager* "And there is still a lot of… Well, it's not finger pointing but this is your service, you should be managing this. Well, actually, they had created the problem but hadn't recognised that this problem that I need to be aware of, don't leave it until you've got a second follow-up meeting or a third follow-up meeting with an individual that says I'm not sorting it out. Tell me that there's a problem that I need to be aware of that I can actually do something about. Don't assume it's my fault 100%." *0107, General Manager* "I will say something, although I don't think that that culture is welcomed" *0116 General Manager*
	Fostering Psychological Safety in teams	"If they need a hand they can ring me anytime they want. They very rarely do, but quite often they will ring and they will give me what their solution is, because they just feel that they need some support. And of course, the more support you give, the less they ask, because they know that they'll get it, and that's important." *0094, General Manager* "So, I really try to lead by example. But also, I try to be really clear that people can come to me, that this is what it's done for. But also, to walk the walk as well and make sure that I am doing it and not just saying it." *0098, General Manager*

		"Always. Always. I think it's really important to know the whole of your team end to end where you can. The open door policy, always had an open door policy. It's like Piccadilly Circus, but nobody should be afraid. It doesn't matter what grade band, whatever you are, nobody should be, or is, afraid to walk in" *0099, Operations Manager* "Yes, in so far as I'm very clear with them and if we have a conversation, it's around, you can come to me with anything. I would never turn around to somebody and be like, I'm not interested in what you're telling me, go away. Sometimes conversations go down the road of, you need to fix this and I'm going to help you figure out how to fix it. It's rare that it's like, I'm going to fix this for you, because you're normally talking to quite senior people" *0100, Divisional Director* "I'm conscious that the leadership responsibly is to be open and have people able to speak about anything to me or with me. I'd like to think that I do create that opportunity and that culture within the site, and I have done that over the last 12 months." *0101, Hospital Director* "I did it in a way that was exactly designed to create psychological safety. And for people to really share their fears, and their anxieties, and their aspirations, and their all sorts of feelings about what this future might hold. And about the process that they were going through at the same time." *0103, Programme Director* "I would like to think my team think there's a culture of psychological safety. But it's about saying, let me know if there's a problem. Just come in. And, just checking in with people and saying, is everything okay?" *0106, General Manager* "I personally do and particularly encourage my team, the team a level below me and a level below that to do the same, to get the feedback and get, how can we change things, how can we do things? It's not always easy." *0107, General Manager* "I do believe in a completely flat structure. I want to believe that I nurture a culture where everyone can speak up. From my experience, I can tell you that my managers are speaking up a lot." *0109, General Manager* "But I also have an open-door policy. Whoever is angry or upset at work, they just come in, and I listen and I take it for them and then we move on." *0109, General Manager* "I think I do try to promote an open culture, but it is such a large team that I don't know if everyone would feel the same way, if I'm honest." *0110, Business Manager* "I don't have the answers to everything at all, and I think if I can't create an atmosphere by which my teams can challenge me, then that puts patient safety at risk." *0116, General Manager*

		"Yes, I definitely feel that I try my best to ensure that that's a culture we have as a service so people can say, I don't think that's a good idea, or have you thought about this, or have you thought about that? Definitely." *0116, General Manager* "And I would always encourage my staff to speak up, and if they want to be part of meetings, I would always definitely encourage that. *0117, Service Coordinator*
	Experiences of negative consequences of psychological safety	"Yes, all the time. All the time. It doesn't last for long, but it's almost like I've opened the door to you. The least you can do is check I'm not on the phone or something. But it's fine. They know. And it can be, because then, you sometimes don't have enough time to do everything else" *0099 Operations Manager* "Yes, it has quite a few downsides. There's a purely personal one, which that it can be really exhausting. So if you set yourself as a, I'm going to be someone who anyone can speak to, you have to be willing to accept the fact that anyone might come and speak to you. As well as taking up a lot of time, which is fine, you can manage that, it can be really difficult to absorb all those other issues." *0100, Divisional Director* "From a member of staff's point of view, you can also, by accident as well, have a bit of a dependent relationship. Then when you try and cut that off, you're like, you don't need to talk to me about this, just go and do it, it can be quite difficult. So there's lots of downsides, but it's quite difficult to predict, it's all about personalities and circumstance" *0100, Divisional Director* "Yes. In terms of resilience, it can be quite difficult. And it's difficult to separate out what someone's moaning and griping, and you just need to compartmentalise and let them offload. And then, versus something that you'd have to do, figure out. Because if someone, understandably, is complaining consistently about something, you feel really accountable and responsible." *0105, General Manager* "There are difficulties because I've got in my service quite a significant number of consultants and if you have three consultants in a room and you ask one question you will have four different opinions." *0107, General Manager* "It's about trying to find that little balance], and it is quite difficult to find that balance", *0110, Business Manager* "I know, and I don't have time just to sit and have a chat about your daughter, or if I do, I'm hurrying you along. And I really don't like that, and I will say to people, oh, but I don't want you to feel that about me. You can come and talk to me." *0111, Business Manager* "Yes and no. A lot of questions is fine, actually. And if you can tell people why things happen the way they do and why you have to be focused on the things you're focused on, it may help them understand where do they fit into your life? I get loads and loads of

		aimless complaints of just general moaning. It's often hard to differentiate is this an individual coming to me who just wants to moan, where you can sit and listen to it and go, I know, there's crap all over. Or are there unreasonable pressures put on management colleagues to fix things which are inherently flawed and cannot be fixed? That's the two differences. If they're wanting to come and have a chat and complain all about that I have three chairs in my office, two chairs are positioned where if you walk past my office you can't see the person in the chair. So, some people just turn up and have a moan. I just say, you can sit in the chair." *0113, General Manager*
RESILIENCE	Presence of resilience and maintaining resilience	"I'd say, probably quite a resilient person, quite a mentally resilient person.", *0096 General Manager* "And you teach your team how to be resilient about it. We can't fix everything. That's what this is about. You're not going to get it right all the time. You are, sadly, going to get something wrong or mess something up. Or it didn't go in the plan you wanted it to go in. But you learn from that. And for me, a failure of that would be something like failing a timeline or failing at patient care. Not detrimentally or fatally but could be detrimental…… And this is where your bigger picture comes in. Because the resilience is yes, yes, yes. You're going to give me that, but actually, I'm going to make such a difference here that when I leave today, I'll have no mental breakdown that I've failed something. Because I'll deal with you tomorrow" *0099, Operations Manager.* "So I think there's a bit of me that goes, what does personal resilience mean, and what I realised is that I guess number one, we often as managers or as leaders mistake the ability to get through the day as being resilient. You can show up to work, you can get through all your meetings, you can be good at your job, but that doesn't actually mean you're being resilient, you might still be holding quite a lot of anxiety or whatever. But the other bit which is probably a bit bigger, for me anyway it depends almost entirely on where I'm working and who I'm working with and the cultural level the organisation has got. And that makes you more resilient because you're walking round carrying less anxiety. So I think a lot of it depends on your organisational culture, which I think is really hard to measure." *0100, Divisional Director* "I think, that's something that I've learnt is, if someone gives you a bit of feedback, that's their opinion and it's one day of their life and your life, and it's not necessarily the truth. There might be truths in it, but you've got to decide what you do with that information, you don't have to internalise it. So, that's a bit of resilience, I guess I've improved this last year, yes." *0103, Programme Director* "I will always take difficult challenges. But there also bits where I've been more mindful, actually, that I don't take on stuff blindly, without even thinking about the consequences of going to be onto myself." *0108, Divisional Director*

		"Yes, I think I probably have become more resilient. I think I've learnt to seek support as needed, maybe in a slightly more proactive way, and offer it in a much more proactive way as well. And to roll with the punches a bit more, there've been a few crunch points, but just not to take it personally." *0103, Programme Director* "I think, I don't know, it depends on how resilient you are, but I've learned resilience because you know that the things you might be stressed about one day, probably aren't going to be the things you're stressed about the next day and the next day." *0106, General Manager* "I have coping mechanisms I've developed that put up glass screens in between people and me so that says I don't take their stress. So, I'm very good in a crisis, I don't take their stress and I teach people that resilience and how to manage what is going on around them at work because they need to do that and nobody teaches you that. You have to learn those techniques and what works and try something different and I do that extremely well to the level that people say you never get stressed." *0107, General Manager*
	Development of resilience	"Well, the more good people you appoint, the less sort of hands-on management you have to do. And then you can apportion things to different people, which I'm doing more of now, which makes things… That's quite important from a resilience point of view." *0094, General Manager* "And if you're not used to that, it can feel like you need to give everybody everything, but actually I always find that if you talk to people, try and get to the bottom of what the problem is, it normally pays off. But, you know, you get a bit of a thick skin; you have to because I don't think they mean it personally, normally they're fighting for their patients." *0095, General Manager* "there is a bit of a balance and I think my own instinct or my own self-preservation, I guess, I'm the type of person that when they ring up and say, can you come into my office, I automatically assume that I've done something wrong. Because if I start from a place where I'm in the wrong, then anything is going, because if I'm in the wrong, I'm already dealing with that. If it's better than that, then it's always better" *0096, General Manager* "Yes, because you also find similar themes that crop up in a cycle every few years. If you've got three or four different services, it might happen in one service, and then you'll see the pattern emerging in another. But because you've done it, experience is one thing. But just going back to that point is it is about patient care, but equally it's about caring for the people who deliver that care too. Because that's a key point, is that if you see something emerging with one team who've really had a bad time of dealing with whatever it was, you put steps in place to protect the next team that you can see that problem emerging." *0099 Operations*

		Manager "And more experience in terms of being able to deal with them to a certain extent. So, I wonder what the ten year ago me would have made of these last 12 months and some of the challenges we've had. But largely your experience is the more bruised on occasions you get, the better you should be in the future. As long as you take the learning from those. So, I'd like to think that there's something around that ten years of experience that makes it more effective at communicating the downs as well as the ups" *0101, Hospital Director* *"*I think, learning. Just learning from experience, really. The things that you might, you know, you get a hammering in one meeting about something, and then, by Friday, there's something different to worry about, and no one's remembered that. It's things like that. It's just learning how to deal with things. And also, I think, when you get hammered in a meeting, it's usually because someone else has worried and stressed about something." *0106, General Manager* "Huge frustrations. I have learned to compartmentalise everything. That's not only with the frustrations of not getting things done and the impotence of getting things done that is the NHS, but it's also I compartmentalise everything that I do so that I don't take work to other areas of my life and I don't take other areas of my life to my work." *0107, General Manager* "I've become courageous on behalf of the people that I serve. I'll probably put it that way. I would hope that in that courage, probably, I've had to learn the courage to be vulnerable as well. Because in terms of resilience, if you think of resilience in the fact that actually, you're carrying a huge amount of information and worry, and input and output, and all of that. And, everybody's stress and concern and anxiety, and timelines and tensions, and everything else. So, absolutely. Loads of it." *0108, Divisional Director*
	Contributors to low resilience	"It is really typical, when I think what we feel, quite often, myself, is stuck in the middle of. And, trying to manage the expectations from our staff, but also try and lobby those above us to try and get some change. It's just really slow going. It's really difficult" *0095, General Manager* "And, actually, we're here because we feel that we want to make a difference, and we're here because we believe in it, and therefore, we're not the people, necessarily at the frontline. We do get a lot of bad press, and it has been in the press, about how terrible managers are, and so much money is spent on managers. They're a waste of time and resource." *0105, General Manager* "I think it's quite lonely. I think it can be quite a lonely job, and that's where you really need to seek your support from your triumvirate and the other peers. Because, although you can talk to your deputy and your direct reports about stuff, and I get on

		really well with mine, I can't burden them." *0106, General Manager* "I think that's something to watch, because that means your talent drain at level, and people will get burnt out. So, yes, that will be the piece I just wanted to share with you. I think it's that kind of continuous piece that, and particularly at the moment, when it's post-COVID too. I think it's hard for people." *0108, Divisional Director* "I'm going to be really honest, it affects your resilience negatively, because you just get so sick of the waste of your time, I think." *0116, General Manager* "And I'd say the frustration impacts on your resilience, because you just think, am I going to ask my teams to go back and look at their processes to see if they can shave off £10,000 here or £5,000 there? The time it'll spend for them to do that is probably more than the saving that they're trying to make, that we have done this and we can't think of anything else." *0116, General Manager* "As a service manager or business manager, you're the one that gets the brunt of the clinicians' frustrations." *0117, Service Coordinator* *"*I think the bit that's tricky is accepting that not only do you not know what all the problems are, but you can't fix all the problems and that's the bit that becomes quite hard." *0100, Divisional Director*
	Provision of support for managers in comparison to clinical staff	"I think first of all, I think it's been quite annoying that the government and the wider public sort of define the NHS as doctors and nurses. I mean, they don't even talk about like, therapies and paramedics or any of that. So I think very often, the big national stuff is directed at those groups anyway. I think certainly with junior doctors and with nurses, it was pretty ropey before COVID, and COVIDs just pushed a lot of it over." *0100, Divisional Director* "Let's call for this. We've had a change of director recently who's very, you need to take care of yourself, think about you. Before that, I think that there wasn't that focus. So I think things have changed direction for the better over the last two or three months." *0102, Deputy General Manager* "If you know you need support on something, it depends on what sort of person you are, but if you need someone to talk to, you've got to seek it out. No one's going to deliver you a support package on a plate, we're all big enough and grown up enough, I think, to try and be trusted to access that ourselves." *0103, Programme Director*

		"I don't think we are. We absolutely not, but I think, even if it was offered to us, we wouldn't accept it because there's an exception. It's not for us because our lives aren't as difficult as theirs," *0105, General Manager* "I think, up to this point, there probably was not. Even thought, if you look in terms of response, there was not an adequate recognition of the impact it has on managers." *0108, Divisional Director* "No, not at all, not even a… Don't get me wrong. From our line managers we get those, like, oh, well done, thank you so much. But nothing." *0109, General Manager* "When the trust is trying to make an attempt to save money, the first vacancies that would be cut are admin, so you think you have to put through a good case to say why you really need the staff that you need, whereas you probably wouldn't get that challenge with a clinician or nurse or for someone with a clinical background, I think." *0110, Business Manager* "And like you said, we're forgotten as admin I would say. That there's this whole work we're doing in the background, but nobody really thinks that we still have to come to work every day. We have to do all of that. We still have a personal life and problems in personal life…….. So, I think we are a little bit overlooked in how things can be done." *0112 Service support manager* "There is no forum for us other than each other in terms of peer review, peer-to-peer support. There is nothing for general managers where you can have that outlet." *0116, General Manager* "I think as a manager, you try and put on a brave face, because you're also very aware that for your staff, you need to make it seem like everything's fine." *0117, Service Coordinator* "I don't know. I think I've never really, I suppose, asked for that help. I think we are expected to just get on with things sometimes, and I think there are managers who… I'd say for me, I suppose I've been around a few years, but younger managers, I can imagine, would find that really upsetting and stressful. It probably is something that could be done a bit better, I think, in terms of that, because you do get… As a service manager or business manager, you're the one that gets the brunt of the clinicians' frustrations." *0117, Service support manager.* "And we just keep going and going and going." *0102, Deputy GM*

	Ability to say if not coping	"Not only do not think managers have had that level of influence, but I think managers are bad at saying they need it…… So no, I don't think we've been very good at it, but I think that's a profession, I don't think we've sorted it out. I think we've just done the whole humble, British, just soldier on." *0100, Divisional Director* "I think we support each other, and sometimes, you know, it's not PC for a manager to say I'm struggling, whereas it might be for a clinician." *0104, General Manager* "Oh, absolutely. You can't admit that you're struggling. You have to do long hours. It's accepted of you. You can't possibly leave at five o' clock. And, definitely, most people are martyrs, of course. But they might think that's… It's again, because it doesn't pay that well, so it's kind of, really values-driven." *0105, General Manager* "But I think, to say, do you know what, I'm really not coping here. I think, yes, that would be difficult to admit….. Because you're at the top. You want to become this GM. It's quite hard. You get there and then, suddenly, to say, actually, do you know what. You know, I think it would be hard. I think it would be hard to admit." *0106, General Manager* "I think you're just expected to just get on and do it, if I'm honest, and there is an element of resiliency you just need to have.: *0110, Business Manager* "Just get on with it. This is contained within your directorate. It doesn't matter what happens if you're the accountable person it's going to come back to you. There's always a bit of a hesitance of people to take annual leave because you can't cancel clinics, you can't get someone on banks to cover your ward shift. It just is an ongoing thing. So, there is no allowance on those limited things" *0113, General Manager* "Sometimes, you could work all hours under the sun and nobody would ever say, no, stop and go home and have a rest, they would just be like, well, that's fine. There is an expectation, I think, as a manager that you are on-call all the time as well." *0117, Service Coordinator* .
	Presence of peer support	*"And we actually found that we found a voice as a group, and then our CLO took that on to chair the group and really listen to what people say. And it was quite interesting, because if you get all of us together, there's actually not a lot that we can't do. And there's not a lot of people that can say we can't do it, either, because we're all together." 0094, General Manager*

		"I think at best we used to come together once a week for about an hour with a very set agenda. And the aim was just to get through the agenda and clear off again. As opposed to actually use the time effectively to share ideas, to share skills, to share expertise." 0101, Hospital Director *"I think particularly within the divisions, so the medicine peer group, I can see evidence of people sharing ideas and being quite collaborative, there's times more or times less." 0103, Programme Manager* *"Yes. I think for me, the most important relationship you can have is with your peers. Your GM colleagues. I think one of the things that's really been lacking, you don't really get that in lockdown, and all the distancing. You don't have that. I think, at these senior levels, a supportive boss can be good, but ultimately, they need to get on with the job. At this senior level, you're expected to do it and get on with it." 0106, General Manager* *"I'm not sure about that, actually. I don't think so. I think it's more about learning from what you're, you know, this is what [unclear]. Oh, we've got this set target. How are you going to do it? What you doing? That is the most important relationship for me. That it's not like point scoring. It's like a collaborative team work. There's always some people there who want to be the best, and so, don't share information. Knowledge is power. Or, I know something you don't know. But I think most of the GM groups are really collaborative." 0106, General Manager* *"And then we are trying to change the direction the trust is going and to influence decisions. If you think, there are only 12 of us, and between 12 of us, we are managing this hospital completely." 0109, General Manager* *"And they will call me and say, oh, because I'm really good in operational management, I'm very good with recoveries and things, so they would ask my advice. I recovered a couple of our problematic services. We do that. We're quite a good group now, I think." 0109, General Manager* *"I think some sort of more formal, structured training at the outset, I think would be a good thing. I think the peer to peer, enabling some sort of more formal peer to peer support, I think is good. Yes, I think those would be the two things that would make a difference." 0111, Business Manager*
STRESS	Accountability and potential repercussions	"I am the accountable officer for it. So, I suppose, it's as much me. Yes, pluses or minuses come down to me in the end, so obviously the management teams or even some of the nursing teams, particularly, will have a responsibility around the management of money. So, for ordering and staffing and all of those things that make up the spend. But, ultimately, what we do or don't do and how we perform, is accountable to the general manager, yes." *0096 General Manager* "Because we're supposed to know. We're the ones who fix everything. So when we're not in a position to be able to fix it, and we're just waiting for the next instruction, you're almost negligent. That's how it feels, or that's how it is viewed, that you're being

		negligent. You're not looking after us." *0099, Operations Manager* "I'm not sort of like, going into my performance review with my boss, I'm going to balance all my books. I'm more like, I'm going to make this look as good as possible, because the money's bad. And the only way I could fix it is broad brush changes to services which would be in no one's benefit. So it would be saying, I know you've got these gaps on your anaesthetic rota that you can't appoint any more consultants, because I want to save that 200 grand you've got. And you're just going to have to make this work." *0100, Divisional Director* "Or if we do this how do we manage because the finance don't have a finite amount of money there, how do we manage the whole thing to say, we can do it within budget or the consequence of not doing it is such that we need to do it and just accept that finances are going to be shocked if you like." *0107, General Manager* "You take it in the next year. Not for me personally. This is one thing, downfall [?], with the NHS, is that there is not a lot of accountability. I think there should be, but I think because they're giving us such unreasonable targets sometimes, accountability is lacking, because they know we can't meet it. But, e.g., I met every single target, CIP target, I ever had, and what I get in return is certain business cases approved that potentially would not be approved if I did not meet my standards, if that makes sense." *0109, General Manager* "I don't think so, but then at the same time, I think it's probably a conversation, that it's probably the GMs who sit in front of the finance board of directors to explain what's happened there…… And I think that's probably the bit, is when you're… I think the most stressful bit is having to sit in front of a panel of people and explain why you weren't able to deliver the impossible." *0110, Business Manager* "So it depends now, it's different than obviously, previously if you breached, 52-week breach, for example, for treatment, which in our case it's a surgery, it was a financial impact on the department. NHS England has you then on their list that you have officially too many breaches and your managers asking, why did that happen? And then you have investigations and all of that." *0112, Service support manager* "I would say the ultimate source of stress is always there are lots of people who are given designated roles and paid for certain roles could be [unclear] roles, audit roles, quality roles, whatever. But if it's ever not done, it always goes back to the business manager or general manager There's always a deep lack of accountability elsewhere. So even though it may not be the managers role, they will be dragged in to fix it at last minute under huge stress." *0113, General Manager*

		"Even though we work as equals, at the end of the day, if anything goes wrong, then all the joy of the accountability sits with me." *0116, General Manager* "Oh, you get monthly… Terrible show-and-tell meetings, so they're performance reviews. You have to turn up with your, what are they called? I can't remember. It's basically when you're on the naughty step, what are your measures to bring it back in line and what are you doing? You have to produce yet another set of countermeasures, that's it, against your poor performance against your SIP" *0116, General Manager* "my job is to make sure that we demonstrate we're meeting those targets or standards, because if you don't there will be some financial impact on us." *0109, General Manager*
	Bureaucracy	"I think my frustrations as a manager and as part of that triumvirate is very much there's a lot of obstacles/hoops to go through." *0101, Hospital Director* "It's painful. We know our service better than anyone. We know we need more consultants. We know that consultant's left, so you have to replace. So why do I have to go and tell someone who's sitting on an executive board that ITU needs to replace a consultant that's left. Because there won't be enough consultants then. I think if it was a new post, I understand why that has to be agreed. But for things that are like for like replacements, I'm not too sure why someone that's sitting on a board makes that decision for me." *0102, Deputy General Manager* "The difficulty for me is, again dipping on the external interface, is that my finances and my director of influence are completely bound up with other organisations. So, my ability to say change the discharge function. I've got to consult in quite a complex web with lots of other external organisations that have their own budgets, and their own drivers, and their own pressures, and their own staffing concerns, and their own HR processes, that's extremely complicated. But it's not impossible." *0103, Programme Director* "And I think, for such a large organisation, it's so bureaucratic, and everyone is after the same pot of money, and the same slice of the pie, if you were." *0105, General Manager* "But then anything that we do do takes forever to be resolved. So there are things, there are business pieces I have put in back in August last year that I am only now, and we're nearly in August, so it's 11 months. It's a long time pacing August to now in May. So, we're only now starting to chip away and get some of the items resolved so I have part of my service that I need to develop."

		0107, General Manager "I think there is far more bureaucracy in the NHS that impacts on what we do. So, the red tape to get things done and the delays that are out in about decision making really makes the job hard." *0107, General Manager* "I think, as a trust, it can be a bit like walking through treacle in finding out how to do things. And even though I've been in the post for about five years, there are still lots of things that I don't know how to do. At least now, I can normally know who I should speak to, who should be able to help me, but the systems in the hospital, they're not transparent, and it can take a long time" *0111, Business Manager* "But that involves having to put a case together to present to higher people in the management chain to say this is why we need an extra dietician, because we need to see more people and we need to give them more support and we need to be able to put on more dietetic clinics. But making that case is quite difficult and those business cases are really difficult to get through." *0117, Service Coordinator*
	Expectations and targets	"And although we always say to people, we don't expect you to reply all the time, I think a lot of more junior people feel that they should be checking their emails even on their days off and things" *0094, General Manager* "I think that we probably have quite a lot of unrealistic expectations put on us. So, just to qualify that, I suppose that stress in your role is completely dependent on what you're doing maybe." *0098, General Manager* "I think we're responsible for an awful lot that we don't have control over, and there's a bit about, it's just the job. But that can also be really frustrating, because you think to yourself, why am I getting crap about this thing that I had no idea was happening." *0100 Divisional Director* "And sometimes the speed of response is totally unrealistic. But once again, I think that's part of the job and it's part of the political agenda that you're working with." *0101, Hospital Director* "To try and explain to them how slow-moving things are, and that you've had a really difficult shift, but there is no more money and we have to make do. It's hard, because you're the person that has to deliver those messages, and I don't necessarily agree with them. You just toe the party line. It's hard." *0105, General Manager* "And it's like everything needs to be done yesterday." *0110, Business Manager*

		"Definitely, because we're given a budget and then we're told to find 5% savings, and there's a pressure on you to try and be imaginative" *0116, General Manager* "Or you've got a big project and you're dependant on other people actually. Sometimes that's frustrating because they're not working to your timescales; they're working to very different timescales, as such." *0104, General Manager* "And periodically, weekly, monthly, we'll have our deliverables that we are measured against. We present those. We make sure those are working to the governed requirements." *0099, Operations Manager* "So, it's a great service to offer, but in order to keep up with the demand, which is just growing and growing and growing, we're actually constantly managing our resources. So, my role is around ensuring that we hit all the access targets." *0111, Business Manager* "And clearly delivering on all those ideas in a financially difficult environment means you are always going to have some people feeling disappointed around what has and hasn't been delivered. I think my view, as long as we are honest in terms of the reason for not being able to deliver on something and the rationales for not being able to deliver on something." *0101, Hospital Director*
	Responsibilities	"But most of the time it's genuine, you know, if someone needs investment in their services, then my job is to try and help them get that I think" *0095, General Manager* "I'm responsible for the day to day sort of operational running of all the services and the money, the HR, the planning, the performance, the emergency response. Pretty much everything apart from, in terms of area of actual accountability, like the clinical governance. And everything else sits with us. Although broadly you would say that we're still responsible for governance and [unclear] everyone responsible for governance. And like quality and safety sits underneath all the other stuff we do." *0100 Divisional Director* "And I still feel quite stressed by the responsibility of that and making sure they're okay. Even though I know it was the right thing to do and I stand by the decisions I made" *0103, Programme Director* "But, you know, it's a really high focus on quality and safety. Just the smallest thing we do could have such a significant impact.

		That in itself, and trying to manage that, across three sites and so many beds, and so many staff." *0105, General Manager.* "I think it's the weight of the responsibility. I know, some of the times when I've had sleepless nights, it is around some of the things that we deal with. And I've often had this conversation with consultants. I'm not saying it's any less difficult, absolutely. I'm not saying, what we do is more important…..And, it's carrying that burden of responsibility when it isn't legally, you are… There's lots of these pockets of things happening, and if you don't have a responsive senior team and then it stops with you, and you're trying to get people to understand that that's a risk and that's important." *0105, General Manager* "When someone asks me, what do you do, it's like everything. Basically, the accounts board officer for the directorate. Financially, in terms of governance. So, part of a triumvirate who leads the directorate." *0106, General Manager* "Particularly troubleshooting, particularly there is a problem we need to solve this. You have to very much think on your feet, very much run when you might not know how to run, very much trying to find solutions because we can't just say it can't happen. It's about finding a solution and thinking, I need to make something happen, where do I get the funds from? And being that interface between the financial side, the people on the ground who just want to do their job and the making sure everything is safe and secure and the patients safety is managed correctly." *0107, General Manager* "You're responsible for everything from, in terms of quality of care, performance management, operational, plus finance, and the workforce piece." *0108, Divisional Director* "Also, every single incident, any serious incidents, any recruitment issues, any big HR problems, any HR issues, that's all within my remit. It's quite a massive remit, basically making sure that all my directorate is working every day." *0109, General Manager* "But I do treat it like it's my own money. Because I think if you don't, or certainly for me, if I don't, it's just so much, it's so big, and there's so much of it, that you just think, well, I just don't really know, let anything happen that's going to happen." *0096, General Manager* "Because I see when people are budget setting, or business planning, they never factor in what is it that's needed. What is it that's needed, what resource do we need to support the doctors and nurses. We don't do that, we just go how many more doctors, and how many more nurses do we need. So I think that causes a lot of stress." *0102, Deputy General Manager* "If we are over budget so we don't have the budget to spend then there is going to be that challenge that says, I need to do

		something for patient safety. And then the finance are going to kick in and say, you can't do it because you don't have money. And then there is that discussion on how important it is against all the other conflicts that are out there. And there's a decision making process we need to go through that says if we do this we can't do that." *0107, General Manager* "So, if you're looking at individuals who have to manage businesses that turn over £50 million a year that's a big-time business, and that's a big-time team, but that's similar to what each General Manager at [Company] do. And it's like a big-time business. You've got all of your huge expensive equipment, you've got all your expensive clinicians, you've got your safety metrics, quality metrics, financial accountability. That's a full business unit within a wider hospital" *0113, General Manager*
	Workload	"So we end up with these very hectic weeks where you work eight till six, eight till seven, pretty much every day, you do a couple of hours over the weekend." *0100, Divisional Director* *"*But that is the job and you just end up working up a lot of hours and you're tired and frustrated that you can't fix everything. And in moments of being rational, because a rational human being goes, it's impossible to fix everything and he's not worried about it. When you're not being rational because you're tired and because you're being pushed, that it itself is quite stressful" *0100, Divisional Director* "because unfortunately everyone comes to you, but you don't have anyone to go to. And then it gets to the point where you're not sleeping. Managers don't get paid over time. I would be going in on the weekend. You don't get paid for that. That's my decision to go in." *0102, Deputy General Manager* "Generally, yes, although sometimes you think that, you know, sometimes you think, oh, my God, it'll be nice just to do your shift and go home whereas in your operational role you tend to work in the evenings, into weekends, etc." *0104, General Manager* "would say when I first came to [Company] I would do 20 hours of unpaid time a week just continuously. It's down a bit now down, it's down to about ten or 12. But it's more just the hidden thing and more jobs and things are given and you just either have to fit it in or work later. That is a common culture in everywhere I've been managers will work very, very late for no time back" *0113, General Manager* "Because the expectation is, if you are a general manager, you have 37 and a half hours in your job description, but really everyone works 50. Why are you complaining because you're working five ten-hour days…..My boss has even said to me, that's the NHS, that's what you expect, GM, you should be working 50 hours a week because that's how busy you are. Anything above that, this is what's expected of you." *0116, General Manager*

		“It’s really difficult to know who to actually focus your attention on. So you try and learn from everybody equally, but principally there will be areas that have more problems than others. Or at least there are areas that will be more vocal about the problems that they’ve got” *0100 Divisional Director*

Appendix 14. Publications

Grailey KE, Murray E, Reader T, Brett SJ. The presence and potential impact of psychological safety in the healthcare setting: an evidence synthesis. BMC Health Services Research. 2021;21(1):773 https://doi.org/10.1186/s12913-021-06740-6

Grailey K, Bryden D, Brett S. The Faculty of Intensive Care Medicine Workforce Survey–What impacts on our working lives? Journal of the Intensive Care Society. 2019;20(2):111-7. https://doi.org/10.1177/1751143718767056

Grailey K, Leon-Villapalos C, Murray E, Brett S. Exploring the factors that promote or diminish a psychologically safe environment: a qualitative interview study with critical care staff. BMJ open. 2021;11(8):e046699 https://doi.org/10.1136/bmjopen-2020-046699

Grailey K, Leon-Villapalos C, Murray E, Brett SJ. The Psychological Impact of the Workplace Environment in Critical Care A Qualitative Exploration. Human Factors in Healthcare. 2021:100001 https://doi.org/10.1016/j.hfh.2021.100001

Grailey K, Murray E, Billings J, Brett S. How do critical care staff respond to organisational challenge? A qualitative exploration into personality types and cognitive processing in critical care. PloS one. 2020;15(1):e0226800 https://doi.org/10.1371/journal.pone.0226800

Grailey K, Lound A, Brett S. Lived experiences of healthcare workers on the front line during the COVID-19 pandemic: a qualitative interview study. BMJ Open. 2021;11(12):e053680 http://dx.doi.org/10.1136/bmjopen-2021-053680

Appendix 15. Presentations

July 2020: 11th International Virtual Conference on Applied Human Factors and Ergonomics
Oral Poster Presentation: “Psychological Safety in Healthcare Workers: An Evidence Synthesis”
K Grailey, E Murray, SJ Brett

December 2020: European Society of Intensive Care Medicine LIVES 2020
Oral Poster Presenation: “The Presence of Psychological Safety within the Intensive Care Environment: A Qualitative Interview and Questionnaire Study”.
K Grailey, E Murray, SJ Brett
https://doi.org/10.1186/s40635-020-00354-8

April 2021: Human Factors and Ergonomics Society 2021 International Virtual Health Care Symposium
Oral Poster Presentation: “The Psychological Impact of the Workplace Environment in Critical Care.- A Qualitative Exploration”
K Grailey, SJ Brett