BMJ Open

Burnout, well-being and defensive medical practice among obstetricians and gynaecologists in the UK: cross-sectional survey study

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To cite: Bourne T, Shah H, Falconieri N, *et al*. Burnout, well-being and defensive medical practice among obstetricians and gynaecologists in the UK: cross-sectional survey study. *BMJ Open* 2019;**9**:e030968. doi:10.1136/bmjopen-2019-030968

► Prepublication history and additional material for this paper are available online. To view these files, please visit the journal online (http://dx.doi.org/10.1136/bmjopen-2019-030968).

Received 09 April 2019
Revised 06 October 2019
Accepted 10 October 2019

Check for updates

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ABSTRACT

Objectives To determine the prevalence of burnout in doctors practising obstetrics and gynaecology, and assess the association with defensive medical practice and self-reported well-being.

Design Nationwide online cross-sectional survey study; December 2017–March 2018.

Setting Hospitals in the UK.

Participants 5661 practising obstetrics and gynaecology consultants, specialty and associate specialist doctors and trainees registered with the Royal College of Obstetricians and Gynaecologists.

Primary and secondary outcome measures Prevalence of burnout using the Maslach Burnout Inventory and defensive medical practice (avoiding cases or procedures, overprescribing, over-referral) using a 12-item questionnaire. The odds ratios (OR) of burnout with defensive medical practice and self-reported well-being.

Results 3102/5661 doctors (55%) completed the survey. 3073/3102 (99%) met the inclusion criteria (1462 consultants, 1357 trainees and 254 specialty and associate specialist doctors). 1116/3073 (36%) doctors met the burnout criteria, with levels highest amongst trainees (580/1357 (43%)). 258/1116 (23%) doctors with burnout reported increased defensive practice compared with 142/1957 (7%) without (adjusted OR 4.35, 95% CI 3.46 to 5.49). ORs of burnout with well-being items varied between 1.38 and 6.37, and were highest for anxiety (3.59, 95% CI 3.07 to 4.21), depression (4.05, 95% CI 3.26 to 5.04) and suicidal thoughts (6.37, 95% CI 95% CI 3.95 to 10.7). In multivariable logistic regression, being of younger age, white or 'other' ethnicity, and graduating with a medical degree from the UK or Ireland had the strongest associations with burnout.

Conclusions High levels of burnout were observed in obstetricians and gynaecologists and particularly among trainees. Burnout was associated with both increased defensive medical practice and worse doctor well-being. These findings have implications for the well-being and retention of doctors as well as the quality of patient care, and may help to inform the content of future interventions aimed at preventing burnout and improving patient safety.

Strengths and limitations of this study

- First nationwide survey in the UK which examines the prevalence of burnout as well as its relationship to defensive medical practice and self-reported well-being.
- This study includes a large number of doctors working in obstetrics and gynaecology and has a good response rate.
- Use of the Maslach Burnout Inventory, a widely available and validated tool for measuring burnout among doctors allows for comparison with other research in this field.
- The response rate of 54.8% is a limitation which introduces the possibility of selection bias; this must be considered when interpreting the findings.

INTRODUCTION

Doctor burnout and mental well-being is an important concern internationally[1–5] because of the high reported prevalence[6] and serious consequences for both staff and patients.[7] Burnout syndrome, which is a response to prolonged exposure to occupational stress, is characterised by three dimensions: emotional exhaustion (EE), depersonalisation (DP) and reduced personal accomplishment (PA).[8] International studies have shown that burnout is nearly twice as common among doctors compared with other healthcare workers.[7] A recent survey by the General Medical Council reported that 24% of trainees and 21% of trainers from across the United Kingdom (UK) described 'feeling burnt out' based on self-reported symptoms.[9] The consequences of burnout among doctors have been investigated primarily in the United States (USA)[10] with relatively few large studies conducted in Europe[11–16] and Asia[17 18] to validate these findings internationally. These include a negative impact on health including higher rates of

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substance abuse, depression, suicide and a poorer quality of life.[19 20] Moreover, burnout in doctors has a significant impact on the productivity of healthcare organisations, intentions to leave medical practice and both the quality and safety of patient care.[21–25] At present, it is unclear if these findings and the proposed interventions can be extrapolated to the UK due to a paucity of data on doctor burnout in this setting.[26 27]

Evidence from studies in Europe[15 28] and the USA[2] suggest that burnout may be experienced by up to half of doctors in obstetrics and gynaecology (O&G),[29 30] and that the prevalence of burnout in O&G is one of the highest of any specialty. This may be related to the high-acuity and rapid turnover of patients associated with O&G.[31] Burnout is also associated with increased job turnover and reduced workforce retention.[32 33] Furthermore, a key consequence of doctor burnout is the impact on patient care. A recent meta-analysis suggested that burnt out doctors are twice as likely to be involved in patient safety incidents and deliver a lower quality of patient care.[34] This is a significant issue in O&G, a specialty already associated with high levels of litigation,[35] with obstetric claim settlements costing the National Health Service (NHS) over £500 million annually.[36] These high litigation rates are partly attributable to the large number of safety incidents and complaints[37 38] and a parallel culture of intolerance when errors are made. The overall impact of this 'complaints culture' on doctors is substantial.[39] A UK-wide study on the impact of complaints on doctor welfare demonstrated that they are associated with an increased risk of depression, anxiety and suicidal ideation as well as increased defensive practice.[40–42] Defensive medical practice (DMP) is defined as a doctor's deviation from standard practice in response to complaints or criticism[43] which can potentially harm patients as a result of either overinvestigation and treatment or because clinicians avoid involvement in difficult cases.[35] A small study of DMP among UK doctors demonstrated that 26.4% of O&G doctors report practising some form of defensive medicine.[35 43] Although the overall effect and cost of the practice of defensive medicine has not been established in the UK, it is thought to represent a highly significant strain on healthcare resources and in the USA, it is estimated to cost $46 billion annually.[44]

There has been great focus by the UK government through initiatives such as 'The Maternal and Neonatal Health Safety Collaborative'[45] to implement strategies which aim to improve maternity safety and outcomes. A facet of this work involves 'understanding the culture' of the O&G workforce.[45] However, to our knowledge, there is currently no quantitative data relating to burnout among doctors working in O&G in the UK to inform policy and potential interventions in relation to NHS workforce sustainability[46] as well as any impacts on the quality of patient care.[6] Thus, there is a clear need to identify the prevalence and factors associated with burnout among doctors in O&G. We conducted a nationwide cross-sectional survey study to assess burnout, DMP and associated personal and work factors in O&G doctors in the UK. The aims were firstly to ascertain the prevalence of burnout in the cohort, secondly to determine the levels of DMP and doctor well-being and explore their relationship with burnout. Finally, we aimed to explore the relationships between age, gender, ethnicity, doctor seniority, and both burnout and DMP.

METHODS

All consultants (equivalent to an attending physician in the USA), specialty and associate specialist (SAS) doctors (doctors who have completed specialist training but do not have a staff position) and trainees (equivalent to a resident or fellow in the USA) working in O&G in the UK and registered with the Royal College of Obstetricians and Gynaecologists (RCOG) were invited to participate in this study between December 2017 and March 2018. Registration with the RCOG is mandatory for all obstetricians and gynaecologists practising in the UK. Doctors were sent an email containing information describing the study and a link to an encrypted online questionnaire. We made it clear to the participants in the invitation email that their participation was voluntary and that responses would be both anonymous and untraceable. Informed consent was implied on return of the survey. Unique surveys were created for each of the grades described and sent as part of the annual RCOG Workforce and Welfare survey that collects data about doctors' clinical practice and working patterns. During the survey period, four reminders were sent out. All actively practising doctors were included as well as doctors who were on sick leave, maternity leave or suspended from practice. Exclusion criteria included doctors who are fully retired, on a career break, in between jobs, not working in the UK at the time of the survey or those who are currently not employed.

Survey

We used a cross-sectional survey design with three participant groups: consultants, SAS doctors and trainees. We estimate that the time taken to complete the questionnaire was 20 min.

All participants were asked to provide information on demographic variables, including age, gender, ethnicity (Office of National Statistics classification[47]), relationship status and if they have children. In addition, they were asked about some job and organisational factors such as rota design and career or retirement plans which were tailored to the participant group. These parameters were chosen based on previous studies suggesting that they have an association with burnout.[48] The main outcomes —the Maslach Burnout Inventory Human Services Survey for Medical Personnel (MBI),[49] DMP questionnaire and questions concerning well-being were the same for all groups. A copy of the survey (excluding the copyright-restricted MBI) can be found in online supplementary eMethods.

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Main outcomes and measures

Symptoms of burnout

We measured burnout using the MBI,[49] a validated 22-item tool to identify and characterise burnout. The MBI has three subscales to evaluate the three domains of burnout: emotional exhaustion (EE), depersonalisation (DP) and low personal accomplishment (PA). As in previous studies and according to convention,[10 48 49] burnout was defined as high EE (scores of 27 or greater; possible score range from 0 to 54) and/or high DP (scores of 10 or greater; possible score range from 0 to 30) as opposed to a total score. The PA score was also measured with low PA defined as scores of 33 or lower (possible score range from 0 to 48) but this was not used as a criterion for burnout in line with previous published work on the subject.[48]

Defensive medical practice

DMP was assessed using a 12-item questionnaire which has previously been developed and described.[40 42] Items are measured on a 5-point Likert scale (ranging from never to often). Nine items quantify 'hedging' behaviour, which is when doctors are overcautious, leading to overprescribing or overinvestigation. Three items quantify 'avoidance' behaviour which includes not taking on complicated patients and avoiding certain procedures or more difficult cases. We confirm this factor structure in online supplementary eMethods. Consistent with previous work, we defined elevated hedging behaviour as a score of 13 or more (possible score range from 0 to 36), and elevated avoidance behaviour as a score of 5 or more (possible score range from 0 to 12).[40] We defined any DMP as having elevated levels of avoidance and/or hedging.

Doctor well-being

Doctors were asked to self-report on the presence or absence (yes or no) of a variety of common medical symptoms and conditions, including cardiovascular problems, gastrointestinal problems, headaches, minor colds, recurring respiratory infections, depression, anxiety, anger and irritability, suicidal thoughts, sleep problems, relationship problems and alcohol or drug misuse.

Statistical analyses

Spearman correlations between the MBI and DMP subscales and DMP were calculated. In order to investigate the association between burnout, DMP and well-being, we calculated odds ratios (ORs) based on univariable logistic regression with Firth bias correction.

Multivariable logistic regression with Firth bias correction was used to investigate the association between demographic variables and burnout, with results reported as adjusted ORs and visualised with a nomogram. The predictors of burnout in this analysis were age, gender, ethnicity, grade, having children, current relationship, medical degree (MD) origin (UK or Ireland vs other) and work status (full time vs less than full time). A similar multivariable analysis was performed with DMP as the dependent variable. For this model, the same predictors were used, with burnout added as an additional predictor.

For the logistic regression analyses, missing values were singly imputed using the method of fully conditional specification based on the above-mentioned list of predictors, the MBI subscales (as numerical scores) and the DMP subscales (as numerical scores).

R V.3.5.0 was used for the statistical analysis.

Patient and public involvement

This research was designed and conducted without patient and public involvement.

RESULTS

Respondent characteristics

The survey was sent to a total of 5661 doctors. The overall response rate was 54.8% (3102/5661). We received questionnaires from 1481 consultants (53% of 2786 consultants contacted), 1364 trainees (57% of 2375 trainees contacted) and 257 SAS doctors (51% of 500 contacted). Of these, 1462 consultants, 1357 trainees and 254 SAS doctors were actively practising and included in the analysis. The mean age was 50 years for consultants, 33 years for trainees and 47 years for SAS doctors (table 1). The majority of doctors were female (58% of the consultants, 80% of the trainees, 68% of the SAS doctors). Consultants (57%) and trainees (64%) were predominantly white, whereas SAS doctors were most often of Asian ethnicity (42%). Descriptive statistics by demographic variables are presented in table 2. Information on missing data is presented in online supplementary eTable 1.

We were unable to reliably check if our sample for all doctors was representative of the entire population to whom the study survey was sent with regards to age, gender and ethnicity as the RCOG do not a hold a centralised database of these variables for all doctors against which to compare our data. However, the RCOG sent a different survey (Training Evaluation Form; TEF) to 1956 trainees in January 2018 which was responded to by 1754 trainees (89.7%) (online supplementary eTable 2).[50] When comparing our data to this survey, we found that our trainee sample was comparable in terms of gender (79.1% females in the TEF database compared with 79.8% in our cohort). Furthermore, our study population had similar numbers of trainees in the 20–29 and 30–39 age ranges (28.3% and 62.3%, respectively, in the TEF database compared with 24.8% and 66.1%, respectively, in our database). Our trainee cohort consisted of more doctors in the 40–59 age range (9.1% compared with 6.1% in the TEF database) which may be accounted for by missing data in the TEF database. In terms of ethnicity, our sample was also comparable for all groups.

Burnout

Regarding the MBI, the percentage of participants meeting the criteria for burnout was 36% overall (1116/3073; 95% CI 35% to 38%); 31% for consultants (460/1462;

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Table 1 Descriptive statistics by doctor category

	Consultants n=1481	SAS n=257	Trainees n=1364
Actively practising	1462 (99%)	254 (99%)	1357 (99%)
*If actively practising**			
Age, mean (range)	50 (33–73)	47 (27–74)	33 (25–58)
Female	831 (58%)	171 (68%)	1067 (80%)
Ethnicity			
White	831 (57%)	79 (31%)	857 (64%)
Asian	438 (30%)	106 (42%)	288 (21%)
Black	88 (6%)	23 (9%)	90 (7%)
Mixed	58 (4%)	26 (10%)	88 (7%)
Other	37 (3%)	19 (8%)	26 (2%)
Children	1267 (87%)	198 (78%)	585 (43%)
Relationship	1269 (87%)	216 (85%)	979 (72%)
Qualified in UK/Ireland	865 (59%)	42 (17%)	1089 (80%)
Full time	1276 (87%)	211 (83%)	1064 (79%)
Subspecialty (consultants)			
None	1278 (87%)	N/A	N/A
Maternal/fetal medicine	56 (4%)	N/A	N/A
Sexual/reproductive health	34 (2%)	N/A	N/A
Gynaecological oncology	33 (2%)	N/A	N/A
Reproductive medicine	33 (2%)	N/A	N/A
Urogynaecology	28 (2%)	N/A	N/A
Maslach Burnout Inventory			
Emotional exhaustion			
Mean	19.9 (0–54)	18.7 (0–53)	21.9 (0–54)
High† (%)	411 (28%)	65 (26%)	440 (32%)
Depersonalisation			
Mean	4.5 (0–29)	4.5 (0–30)	7.0 (0–29)
High‡ (%)	178 (12%)	33 (13%)	394 (29%)
Personal accomplishment			
Mean	37.2 (0–48)	35.3 (4–48)	34.6 (0–48)
Low§ (%)	382 (26%)	95 (37%)	530 (39%)
Burnout¶	460 (31%)	76 (30%)	580 (43%)
Defensive medical practice			
Avoidance			
Mean	1.4 (0–12)	1.1 (0–12)	0.9 (0–10)
Elevated** (%)	125 (9%)	13 (5%)	58 (4%)
Hedging			
Mean	5.2 (0–36)	2.8 (0–36)	4.6 (0–36)
Elevated†† (%)	164 (11%)	11 (4%)	114 (8%)
Any defensive medical practice‡‡	231 (16%)	20 (8%)	149 (11%)

Continued

Table 1 Continued

	Consultants n=1481	SAS n=257	Trainees n=1364

*Results for each variable are based on available data, that is, excluding participants with a missing value. Gender has the most missing values, 41/3073 (1.3%). Missing values for all variables are reported in online supplementary eTable1.
†Scores of ≥27 (range 0–54) are considered high and indicate burnout in accordance with the Maslach Burnout Inventory.
‡Scores of ≥10 (range 0–30) are considered high and indicate burnout in accordance with the Maslach Burnout Inventory.
§The score range is 0–48; scores ≤33 are defined as low personal accomplishment.
¶Positive for burnout if emotional exhaustion and/or depersonalisation scores high (as defined) in accordance with the Maslach Burnout Inventory.
**Scores of ≥13 (range 0–36) are considered elevated and indicate avoidance behaviour.
††Scores of ≥5 (range 0–12) are considered elevated and indicate hedging behaviour.
‡‡Defined as elevated levels of avoidance and/or hedging behaviour.
SAS, Specialty and Associate Specialist Doctors.

95% CI 29% to 34%), 43% for trainees (580/1364; 95% CI 40% to 45%), and 30% for SAS doctors (76/254; 95% CI 25% to 36%) (table 1 and online supplementary eFigure 1). Between 26% and 32% met the criteria for high EE, between 12% and 29% met the criteria for high DP and between 26% and 39% met the criteria for low PA. The EE and DP scales had a Spearman correlation of 0.57, whereas both subscales correlated negatively with PA (−0.30 and −0.34, respectively) (online supplementary eTable 3).

Defensive medical practice

Increased DMP, according to our criteria, was observed in 13% overall (400/3073); 16% of consultants (231/1462), 11% of trainees (149/1364) and 8% of SAS doctors (20/254). Between 4% and 9% met our criteria for increased avoidance, and between 4% and 11% met our criteria for increased hedging. These subscales had a Spearman correlation of 0.41 (online supplementary eTable 3 and eFigure 1).

Of all participants who met the criteria for burnout, 23% met the criteria for increased DMP (258/1116) (table 3). Of participants who did not meet the criteria for burnout, 7% reported increased DMP (142/1957). The crude OR was 3.84 (95% CI 3.08 to 4.79). The relationship was similar for all categories of doctors, and was observed for avoidance as well as hedging behaviour (table 3 and online supplementary eTable 4).

Doctor well-being

Doctors with burnout had a higher prevalence of self-reported medical illness (table 4). Highest ORs were observed for suicidal thoughts (6.37, 95% CI 3.95 to 10.7), depression (4.05, 95% CI 3.26 to 5.04), anxiety (3.59, 95% CI 3.07 to 4.21), anger/irritability (3.51, 95% CI 3.00 to 4.10), sleep problems or insomnia (3.15, 95% CI 2.70 to 3.67) and substance misuse (2.57, 95% CI 1.71 to 3.89);

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Table 2 Descriptive statistics of burnout and defensive medical practice stratified by demographic variables

	Burnout* (%)	Avoidance† (%)	Hedging‡ (%)	Any DMP§ (%)
Age (years)				
<35 (n=948)	440 (46%)	37 (4%)	93 (10%)	115 (12%)
35–49 (n=1209)	395 (33%)	68 (6%)	114 (9%)	151 (12%)
≥50 (n=916)	281 (31%)	91 (10%)	82 (9%)	134 (15%)
Gender				
Female (n=2069)	763 (37%)	105 (5%)	179 (9%)	239 (12%)
Male (n=963)	332 (34%)	87 (9%)	102 (11%)	152 (16%)
Ethnicity				
White (n=1767)	723 (41%)	114 (6%)	159 (9%)	227 (13%)
Asian (n=832)	229 (28%)	49 (6%)	79 (9%)	105 (13%)
Black (n=201)	57 (28%)	10 (5%)	17 (8%)	21 (10%)
Mixed (n=172)	59 (34%)	14 (8%)	23 (13%)	31 (18%)
Other (n=82)	39 (48%)	3 (4%)	7 (9%)	8 (10%)
Children				
No (n=1023)	473 (46%)	48 (5%)	96 (9%)	126 (12%)
Yes (n=2050)	643 (31%)	148 (7%)	193 (9%)	274 (13%)
Relationship				
No (n=601)	266 (44%)	32 (5%)	51 (8%)	74 (12%)
Yes (n=2464)	844 (34%)	161 (7%)	237 (10%)	323 (13%)
Country of qualification				
UK/Ireland (n=1996)	841 (42%)	125 (6%)	193 (10%)	265 (13%)
Other (n=1075)	273 (25%)	71 (7%)	96 (9%)	135 (13%)
Work status				
Full time (n=2551)	952 (37%)	161 (6%)	248 (10%)	341 (13%)
Less than full time (n=519)	163 (31%)	35 (7%)	41 (8%)	59 (11%)
Subspecialty (consultants)				
None (n=1278)	404 (32%)	116 (9 %)	151 (12%)	213 (17%)
Maternal/fetal (n=56)	20 (36%)	3 (5%)	7 (12.5%)	8 (14%)
Sexual/reproductive health (n=34)	10 (29%)	0 (0%)	1 (3%)	1 (3%)
Gynaecological oncology (n=33)	8 (24%)	0 (0%)	1 (3%)	1 (3%)
Reproductive medicine (n=33)	9 (27%)	2 (6%)	0	2 (6%)
Urogynaecology (n=28)	9 (32%)	4 (14%)	4 (14 %)	6 (21%)

*Positive for burnout if emotional exhaustion score ≥27 (range 0–54) and/or depersonalisation score ≥10 (range 0–30) in accordance with the Maslach Burnout Inventory.
†Defined as avoidance score of ≥13 (range 0–36).
‡Defined as hedging score of ≥5 (range 0–12).
§Defined as presence of avoidance and/or hedging (as defined).
DMP, Defensive Medical Practice.

13.5% (n=416) of all doctors reported depression, but this was 7.4% for doctors without burnout and 24.4% for doctors with burnout. Furthermore, 2.9% (n=90) of all doctors reported suicidal thoughts, 1.0% among doctors without and 6.3% among doctors with burnout. The OR was lowest for cardiovascular problems (1.38, 95% CI 1.07 to 1.78).

Risk factors and correlates

Results of the multivariable models are presented in table 5 and online supplementary eFigure 2. Age, ethnicity and origin of MD degree were most strongly related to burnout. The older the doctor, the lower the reported level of burnout (adjusted OR per 5 years 0.92, 95% CI 0.87 to 0.98) and doctors of white and 'other' ethnicity reported higher levels of burnout (41% and 48%, respectively) than doctors of other ethnicities (28% to 34%). Doctors with an MD from the UK or Ireland also reported higher levels of burnout (42% vs 25%, adjusted OR 1.74, 95% CI 1.41 to 2.16).

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Table 3 Descriptive statistics of defensive practice by burnout status

Doctor category	Avoidance*		Hedging†		Any DMP‡
Burnout status§	Mean score	% elevated	Mean score	% elevated	%
Consultant					
No burnout (n=1002)	1.05	53 (5%)	3.95	67 (7%)	101 (10%)
Burnout (n=460)	2.14	72 (16%)	7.79	97 (21%)	130 (28%)
SAS					
No burnout (n=178)	0.72	3 (2%)	1.74	2 (1%)	5 (3%)
Burnout (n=76)	1.92	10 (13%)	5.34	9 (12%)	15 (20%)
Trainees					
No burnout (n=777)	0.59	15 (2%)	3.30	25 (3%)	36 (5%)
Burnout (n=580)	1.38	43 (7%)	6.46	89 (15%)	113 (19%)
All doctors					
No burnout (n=1957)	0.84	71 (4%)	3.49	94 (5%)	142 (7%)
Burnout (n=1116)	1.73	125 (11%)	6.93	195 (17%)	258 (23%)
OR¶ (95% CI)		3.34 (2.48 to 4.53)		4.18 (3.24 to 5.43)	3.84 (3.08 to 4.79)

*Scores of ≥13 (range 0–36) are considered elevated and indicate avoidance behaviour.
†Scores of ≥5 (range 0–12) are considered elevated and indicate hedging behaviour.
‡Defined as elevated levels of avoidance and/or hedging behaviour.
§Burnout defined as an emotional exhaustion score ≥27 (range 0-54) and/or depersonalisation score ≥10 (range 0–30) in accordance with the Maslach Burnout Inventory.
¶ORs are based on univariable logistic regression with Firth bias correction.
DMP, Defensive Medical Practice; SAS, Specialty and Associate Specialist Doctors.

Regarding any DMP, burnout was the strongest predictor, followed by age, type of doctor and ethnicity. The adjusted OR of burnout to predict increased DMP was 4.35 (95% CI 3.46 to 5.49). Consultants, doctors of mixed ethnicity and to a lesser extent older doctors reported the highest levels of DMP.

DISCUSSION

In this large nationwide study, we have shown that just under half of trainees and a third of consultants and SAS doctors working in O&G in the UK suffer from burnout using the MBI scoring system. Furthermore, our data suggests that burnout is associated with higher levels of DMP, and with poorer mental and physical well-being.

The overall prevalence of burnout in this study is consistent with smaller international studies conducted within O&G[28 29 51] but lower than reported in the USA.[2 52 53] This may be explained by differences in the way burnout has been measured, the small number of subjects included in some studies, differences in healthcare systems as well as medical training, and the hours of work in the UK which are restricted by the European Working Time Directive. A lack of personal accomplishment and emotional exhaustion were the most commonly endorsed subscales, followed by depersonalisation. The particularly high levels of burnout among younger doctors, of whom the majority are trainees, may provide insights into a recent RCOG national training and workforce report.[54] In this, nine out of ten O&G trainees reported feeling low in mood, depressed or anxious since starting specialty training.[54] In keeping with this finding, and with a number of American studies,[48 55] our data indicate that burnout is associated with a negative impact on doctor well-being and is strongly associated with depression, anxiety and suicidal thoughts.

Our study reported a particularly strong relationship between burnout and suicidal thoughts; worryingly, suicidal ideation has been shown to be strongly associated with actual suicide attempts and death.[56] Furthermore, suicide rates in doctors are known to be much higher than for the general population.[57] A study of surgeons in the USA[58] found the prevalence of suicidal ideation in this group to be 6.3%; although this is higher than the prevalence in this study (2.9%), we found the association between burnout and suicidal ideation to be higher (OR, 6.37 vs 1.91[58]) in our cohort. This may reflect a vulnerability among doctors working in O&G compared with other specialties[28 29] or the differences in healthcare services and culture internationally.

Studies in the USA have indicated an association between burnout and increased workforce turnover[59] which has both financial implications and an impact on healthcare organisation productivity. The RCOG national workforce report[54] has reported that three quarters of trainees have considered leaving O&G practice. In our study, as well as the highest prevalence of burnout among trainees, almost a fifth of trainees reported depression and over a third reported anxiety. These symptoms were markedly more prevalent in the cohort with burnout, and depression has been shown to be independently associated with an increased self-reported

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Table 4 Descriptive statistics of self-reported well-being, and ORs (with 95% CIs) with burnout

	All (n=3073)		Grade		
	N (%)	OR* (95% CI)	Consultants, N (%)	SAS, N (%)	Trainees, N (%)
Cardiovascular problems	261 (8)		186 (13)	31 (12)	44 (3)
No burnout	148 (8)	1.38 (1.07 to 1.78)	114 (11)	20 (11)	14 (2)
Burnout†	113 (10)		72 (16)	11 (14)	30 (5)
Gastrointestinal problems	480 (16)		221 (15)	29 (11)	230 (17)
No burnout	225 (11)	2.28 (1.87 to 2.78)	111 (11)	14 (8)	100 (13)
Burnout	255 (23)		110 (24)	15 (20)	130 (22)
Depression	416 (14)		141 (10)	41 (16)	234 (17)
No burnout	144 (7)	4.05 (3.26 to 5.04)	42 (4)	21 (12)	81 (10)
Burnout	272 (24)		99 (22)	20 (26)	153 (26)
Anxiety	1008 (33)		416 (28)	80 (31)	512 (38)
No burnout	439 (22)	3.59 (3.07 to 4.21)	194 (19)	43 (24)	202 (26)
Burnout	569 (51)		222 (48)	37 (49)	310 (53)
Anger-irritability	1048 (34)		498 (34)	81 (32)	469 (35)
No burnout	465 (24)	3.51 (3.00 to 4.10)	235 (23)	42 (24)	188 (24)
Burnout	583 (52)		263 (57)	39 (51)	281 (48)
Suicidal thoughts	90 (3)		33 (2)	2 (1)	55 (4)
No burnout	20 (1)	6.37 (3.95 to 10.7)	5 (0.5)	0	15 (2)
Burnout	70 (6)		28 (6)	2 (3)	40 (7)
Sleep problems/insomnia	1188 (39)		515 (35)	93 (37)	580 (43)
No burnout	563 (29)	3.15 (2.70 to 3.67)	256 (26)	52 (29)	255 (33)
Burnout	625 (56)		259 (56)	41 (54)	325 (56)
Marital/relationship problems	544 (18)		206 (14)	43 (17)	295 (22)
No burnout	241 (12)	2.65 (2.20 to 3.20)	105 (10)	20 (11)	116 (15)
Burnout	303 (27)		101 (22)	23 (30)	179 (31)
Frequent headaches	652 (21)		210 (14)	77 (30)	365 (27)
No burnout	317 (16)	2.22 (1.86 to 2.64)	107 (11)	37 (21)	173 (22)
Burnout	335 (30)		103 (22)	40 (53)	192 (33)
Minor colds	812 (26)		268 (18)	59 (23)	485 (36)
No burnout	449 (23)	1.62 (1.37 to 1.91)	165 (16)	42 (24)	242 (31)
Burnout	363 (33)		103 (22)	17 (22)	243 (42)
Recurrent respiratory infections	188 (6)		66 (5)	16 (6)	106 (8)
No burnout	81 (4)	2.45 (1.82 to 3.31)	31 (3)	10 (6)	40 (5)
Burnout	107 (10)		35 (8)	6 (8)	66 (11)
Alcohol/drugs problems	97 (3)		56 (4)	4 (2)	37 (3)
No burnout	40 (2)	2.57 (1.71 to 3.89)	24 (2)	2 (1)	14 (2)
Burnout	57 (5)		32 (7)	2 (3)	23 (4)

*ORs based on univariable Firth corrected logistic regression of well-being item vs burnout with stratification for group (consultant, SAS, trainee).
†Burnout defined as an emotional exhaustion score ≥27 (range 0–54) and/or depersonalisation score ≥10 (range 0–30) in accordance with the Maslach Burnout Inventory.
SAS, Specialty and Associate Specialist Doctors.

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Table 5 Univariable and multivariable logistic regression results (using Firth bias correction)

	Burnout*		Any DMP†	
Predictor variable	Crude OR	Adjusted OR	Crude OR	Adjusted OR
Grade (vs consultants)				
SAS	0.93 (0.70; 1.24)	1.14 (0.83; 1.55)	0.47 (0.28; 0.73)	0.40 (0.23; 0.65)
Trainees	1.63 (1.39; 1.90)	1.00 (0.77; 1.31)	0.66 (0.53; 0.82)	0.47 (0.32; 0.70)
Age (per 5 years)	0.87 (0.84; 0.90)	0.92 (0.87; 0.98)	1.04 (0.99; 1.09)	0.93 (0.85; 1.02)
Female (vs male)	1.12 (0.95; 1.31)	0.97 (0.81; 1.16)	0.70 (0.56; 0.87)	0.70 (0.55; 0.89)
Ethnicity (vs white)				
Asian	0.54 (0.45; 0.65)	0.74 (0.60; 0.91)	0.98 (0.77; 1.25)	1.15 (0.85; 1.54)
Black	0.57 (0.41; 0.78)	0.73 (0.51; 1.02)	0.79 (0.48; 1.24)	0.90 (0.53; 1.47)
Mixed	0.75 (0.54; 1.03)	0.82 (0.58; 1.15)	1.53 (1.01; 2.27)	1.89 (1.21; 2.89)
Other	1.37 (0.88; 2.12)	2.19 (1.37; 3.52)	0.84 (0.40; 1.59)	0.64 (0.29; 1.30)
Children	0.53 (0.46; 0.62)	0.78 (0.64; 0.97)	1.10 (0.88; 1.38)	1.03 (0.75; 1.41)
Current relationship	0.65 (0.54; 0.78)	0.87 (0.70; 1.07)	1.06 (0.82; 1.40)	1.07 (0.79; 1.46)
Medical Qualification from UK/Ireland (vs other country)	2.13 (1.81; 2.51)	1.74 (1.41; 2.16)	1.06 (0.85; 1.33)	0.84 (0.63; 1.14)
Full time (vs less than full time)	1.30 (1.06; 1.59)	1.28 (1.02; 1.62)	1.19 (0.90; 1.61)	0.91 (0.65; 1.27)
Burnout			3.84 (3.08; 4.79)	4.35 (3.46; 5.49)

*Burnout defined as an emotional exhaustion score ≥27 (range 0–54) and/or depersonalisation score ≥10 (range 0–30) in accordance with the Maslach Burnout Inventory.
†DMP defined as elevated levels of avoidance and/or hedging behaviour.
DMP, defensive medical practice; SAS, Specialty and Associate Specialist Doctors.

likelihood of leaving practice among surgeons.[60] Better understanding the relationship between burnout, well-being and staff turnover intentions is of great importance to ensure retention of the workforce going forward. This knowledge will also help to inform the content of interventions aimed at identifying and preventing burnout, and improving the well-being and retention of doctors early in their careers.[61] The majority of interventions proposed to date have been individual-focused strategies which include mindfulness,[62] personal coping strategies and exercise,[63] or some combination of these. However, a recent meta-analysis of interventions to reduce doctor burnout found that organisation-directed interventions (such as reducing workload, changing rota/shift patterns or group sessions to enhance teamwork) had a more significant effect on reducing burnout than individual approaches alone.[23] This highlights the importance of implementing organisational strategies[64 65] along with continual assessment of burnout, to develop a healthy workplace environment to effectively tackle this problem.[5]

Our finding that burnout is associated with increased DMP supports the concern that doctor burnout impacts the quality of patient care.[34] In 2010, Shanafelt *et al*[19] showed that burnout is an independent predictor of self-reported perceived major medical errors. Our study shows that consultants with burnout are three times more likely to report both avoidance (avoiding cases or procedures) and hedging (overprescribing or over-referral) which may have significant and serious consequences on patient care. This may be because consultants are less 'protected' than trainees in terms of litigation as they take ultimate responsibility for a patient's care. Furthermore, due to their seniority, they are likely to have experienced more complaints or adverse events during their careers, which have been shown to be associated with DMP.[42] The observation in our study that age is inversely associated

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with burnout is also in keeping with other studies.[66] This may be explained by the fact that doctors who remain within the specialty are inherently more resilient, and that those more affected by burnout may be accounted for in the attrition rate from the specialty.[67] It has also been suggested that the lower rate of burnout seen in more senior doctors is because they may have a better work-life balance and career.[67 68] A further noteworthy association in our cohort was that after controlling for other confounding variables, doctors from ethnic minorities were less likely to experience burnout. Similar findings have been reported in studies of trainees and medical students in the USA[69–71]; however, the reasons for this are unknown. It has been proposed that that these differences may be explained by differences in upbringing and life stressors, which may make doctors from ethnic minorities more resilient.[69] Consistent with this, we found that doctors who graduated in the UK or Ireland are almost twice as likely to experience burnout.

Strengths and weaknesses of our study are important to consider in contrast with other research on the prevalence of burnout in doctors. A strength of the study is that it is a nationwide survey which includes a large number of doctors and is the first study to our knowledge that seeks to explore the relationship between burnout (using a validated tool, the MBI) and DMP. There were several limitations to the present study. First, although the overall response rate was only 54.8% which is a relatively high response rate for a survey study of this type, it still introduces the possibility of selection bias, which must be considered when interpreting the findings. We believe however that the response rate quoted is the minimum rate and is likely to under-report the response rate from practising clinicians (online supplementary eDiscussion). Second, it is plausible that individuals most affected by burnout may have avoided engaging with the survey and conversely those least impacted may not have seen its value which could bias the results. Third, we asked doctors to self-report on medical conditions including depression and anxiety and the questionnaire used to assess DMP, although used in previous studies,[40–42] has not been formally validated. Finally, a limitation of a cross-sectional survey study is that it cannot take into account variability of symptoms over time, which may be influenced by other factors such as time of the year and other personal factors.

CONCLUSIONS

Our nationwide study reports high levels of burnout among obstetricians and gynaecologists in the UK, and that burnout is more prevalent in younger doctors who have trained in the UK. Furthermore, our data suggest that burnout is strongly associated with anxiety, depression, suicidal thoughts and substance misuse. This highlights the impact of burnout on the efficiency and sustainability of the O&G medical workforce which confirms the need to regularly assess and mitigate burnout in doctors. We have also observed an association between burnout and DMP, which has implications for the quality and safety of patient care being delivered as well as the well-being and retention of staff in the NHS. Ultimately, cultivating a greater understanding of doctor burnout and its implications has strategic importance for the sustainability of the NHS workforce and will add to the body of evidence required to improve productivity and patient safety outcomes more broadly across the UK.

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Acknowledgements Victoria Bytel contributed to conduct of the study and facilitated data collection.

Contributors TB had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Concept and design: TB, CL, AW, LR. Acquisition, analysis and interpretation of data: TB, HS, NF, DT, CL, AW, MAL, LR, BVC. Drafting of the manuscript: TB, HS, BVC. Critical revision of the manuscript for important intellectual content: TB, HS, NF, DT, CL, AW, MAL, LR, BVC. Statistical analysis: NF, BVC. Obtained funding: TB. TB is the guarantor and attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

Funding The Royal College of Obstetricians and Gynaecologists supported the costs of using the Maslach Burnout Inventory. The study received no additional funding.

Map disclaimer The funders had no role in the study design; collection, management, analysis and interpretation of the data; preparation, writing, review or approval of the manuscript; and decision to submit the manuscript for publication. All authors had full access to all of the data in the study, can take responsibility for the integrity of the data, and had final responsibility for the decision to submit for publication.

Competing interests None declared.

Patient consent for publication Not applicable

Ethics approval The survey was sent to doctors registered with the Royal College of Obstetricians and Gynaecologists via their email database. The Chair of the RCOG Ethics Committee (Vivienne Nathanson) reviewed the study proposal and confirmed that ethical approval was not required. This was due to the fact that the data collected about doctors was via an encrypted online questionnaire and participants were informed that their participation was voluntary and that responses would be both anonymous and untraceable. Informed consent was implied on return of the survey.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement No data are available.

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