



Quantity and quality of interaction between staff and older patients in UK hospital wards: A descriptive study



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ABSTRACT

Background: The quality of staff-patient interactions underpins the overall quality of patient experience and can affect other important outcomes. However no studies have been identified that comprehensively explore both the quality and quantity of interactions in general hospital settings.

Aims & objectives: To quantify and characterise the quality of staff-patient interactions and to identify factors associated with negative interaction ratings.

Setting: Data were gathered at two acute English NHS hospitals between March and April 2015. Six wards for adult patients participated including medicine for older people (n=4), urology (n=1) and orthopaedics (n=1).

Methods: Eligible patients on participating wards were randomly selected for observation. Staff-patient interactions were observed using the Quality of Interactions Schedule. 120 h of care were observed with each 2 h observation session determined from a balanced random schedule (Monday-Friday, 08:00–22:00 h). Multilevel logistic regression models were used to determine factors associated with negative interactions.

Results: 1554 interactions involving 133 patients were observed. The median length of interaction was 36 s with a mean of 6 interactions per patient per hour. Seventy three percent of interactions were categorized as positive, 17% neutral and 10% negative. Forty percent of patients had at least one negative interaction (95% confidence interval 32% to 49%). Interactions initiated by the patient (adjusted Odds Ratio [OR] 5.30), one way communication (adjusted OR 10.70), involving two or more staff (adjusted OR 5.86 for 2 staff, 6.46 for 3+ staff), having a higher total number of interactions (adjusted OR 1.09 per unit increase), and specific types of interaction content were associated with increased odds of negative interaction ($p < 0.05$). In the full multivariable model there was no significant association with staff characteristics, skill mix or staffing levels. Patient agitation at the outset of interaction was associated with increased odds of negative interaction in a reduced model. There was no significant association with gender, age or cognitive impairment. There was substantially more variation at ward level (variance component 1.76) and observation session level (3.49) than at patient level (0.09).

Conclusion: These findings present a unique insight into the quality and quantity of staff-patient interactions in acute care. While a high proportion of interactions were positive, findings indicate that there is scope for improvement. Future research should focus on further exploring factors associated with negative interactions, such as workload and ward culture.

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1. Introduction

Considerable attention has been paid in recent years to the quantity and quality of interactions between staff and older patients in acute hospital settings. In the UK, retrospective analyses of care failures suggest that interactions between patients and

staff, particularly nurses, were of low quality and frequency, undermining quality of care and patient experiences (Care Quality Commission, 2015; Francis, 2013; Maben et al., 2012a). Findings from enquiries into these care failures have been accompanied by a crisis of public confidence in the ability of nurses in general to be compassionate (Maben and Griffiths, 2008; Prime Minister's Commission on the Future of Nursing and Midwifery in England, 2010; Report of the Willis Commission, 2012). A variety of reforms have resulted across the health service, such as changes to nursing education and recruitment (Department of Health, 2013a; Report of the Willis Commission, 2012). While the UK care failures have had particular prominence, evidence suggests that concerns about the frequency and quality of interactions between nursing staff and patients are shared internationally (Corbin, 2008; Kagan, 2014; Reader and Gillespie, 2013). However, surprisingly little is known about the quantity and quality of interactions between staff and patients outside of settings in which care failures have been identified and studied. This paper presents findings based on observations of staff-patient interactions in six hospital wards in two National Health Service (NHS) hospitals.

When people come into hospital, the quality of their interactions with staff is key to shaping experiences during their stay. For example, older people want nurses and others to use interactions to maintain identity ("see who I am"), to create community ("connect with me") and to share decision making ("involve me") (Bridges et al., 2010). There may also be wider benefits to high quality interactions beyond patient experience. For instance, nurses aim to use their relationships with patients to provide tailored care, comfort and support, including supporting informed decision-making, and assessing responses to treatments, suggesting a clinically therapeutic potential to interactions (Bridges et al., 2013). Furthermore, the links that have recently been indicated between positive experience, patient safety and clinical effectiveness, suggest that quality of interactions may impact on a wider range of important outcomes such as adherence to recommended medication and treatments or technical quality of care delivery (Doyle et al., 2013).

Few studies offer a clear indication of how common the problems regarding staff-patient interactions are. Many that report on staff-patient interactions give retrospective global evaluations using questionnaires. For instance, The 2014 NHS inpatient survey involving 59,000 inpatients showed that 24% of inpatients could not find a member of the hospital staff to talk to about their worries and fears, and 13% did not get enough emotional support from hospital staff (Care Quality Commission, 2015). Measures such as the NHS survey offer a partial view because not everyone can participate, memories may be inaccurate and respondents cannot give a clear view of the frequency of negative experience.

Given the limitations of questionnaire methods, which tend to exclude some of the groups that may be most vulnerable to the impact of negative interactions such as those with cognitive impairment, observational methods may be a more appropriate method to measure the quantity and quality of interactions in general hospital care (Goldberg and Harwood, 2013). A review of the care of older people in 11 acute hospitals in Northern Ireland reported that 67% of 1836 interactions observed were rated as positive and 7% were rated negative (The Regulation and Quality Improvement Authority, 2015). While assessments of interaction quality were made using the validated Quality of Interactions Schedule (The Regulation and Quality Improvement Authority, 2015) the sampling method and context are unclear. A number of studies focusing on the nurse as the unit of analysis indicated that the amount of direct contact time was low, but no data were gathered on interaction quality (Westbrook et al., 2011). No studies have been identified that comprehensively explore both the quality and quantity of interactions with the patient as the unit of

analysis in general hospital settings, an important gap given the degree of attention this issue is attracting in the UK and beyond.

The study aims to address the important gap identified. The specific objectives were:

1. To identify the frequency and length of staff-patient interactions.
2. To characterise the quality of staff-patient interactions.
3. To identify associations between negative interactions and patient characteristics, staffing characteristics, interaction characteristics and observation session characteristics.

3. Methods

Data were collected as part of a feasibility study to develop and evaluate a compassionate care intervention for ward nursing teams (Bridges and Fuller, 2014). The data presented here were collected during the baseline phase of the study using a descriptive design.

3.1. Setting and sample

Data were collected in two acute NHS hospitals in England between March and April 2015. Managers of seven medical and surgical wards with high proportions of older in-patients were invited to include their ward in the study. Six wards participated: medicine for older people ($n=4$), urology ($n=1$) and orthopaedics ($n=1$). Each ward had between 28 and 32 beds. We excluded patients identified by the nurse in charge as palliative, critically ill or reverse barrier nursed. All other patients were eligible for inclusion in the study.

Observations were undertaken in randomly generated time slots for ten two-hour sessions on each ward over a three week period (Monday-Friday, 08:00–22:00), there were 60 observation sessions in total. Observation sessions were balanced between wards and time of day. For each observation session, a random number generator was used to identify an index patient who was then approached and invited to take part in the study. If the patient agreed to take part, other patients in their vicinity were also approached and invited. If the index patient declined to take part, a new index patient was selected. This process continued until an index patient agreed to participate.

3.2. Data collection

The quality of interactions was measured using the Quality of Interactions Schedule (QuIS) (Dean et al., 1993), an observation-based tool that has been used in a number of studies in NHS acute care settings. Interactions between staff and patients are coded as positive social, positive care, neutral, negative protective and negative restrictive (Table 1). The QuIS has been shown to be sensitive to change in service quality (Algar et al., 2016; Brooker, 1995; Dean and Briggs, 1993; Health Advisory Service, 1998; Wewers et al., 1994). In long term residential settings QuIS has been shown to be reliable with kappa coefficients of above 0.75 (Dean et al., 1993). Concurrent validity has been demonstrated by the association of increased quantity and quality of interactions experienced by residents with improvements in ratings of residents' cognitive impairment, observed depression, and functional capacities (Dean and Briggs, 1993). QuIS was originally designed for long term settings, and so prior to the current study a protocol was developed for use by the research team to guide its application in acute settings, including a definition of what constituted the beginning and end of an interaction and how to decide between the different ratings (see Table 1) (McLean et al.,

Table 1
QuIS Category Definitions.

QuIS Category	QuIS Category Definitions	
	Dean et al. (1993)	McLean et al. (2014)
Positive Social	Interaction Principally involving 'good, constructive, beneficial' conversation and companionship	Interactions, which may be expected to make the service user feel valued, cared about or respected as a person. This is achieved through: - Polite, friendly and respectful interactions in which any element is: Casual/informal and relating to 'everyday' social topics (e.g. family; sport; weather; TV programmes) or - Responding to concerns/interests/topics introduced by the service user
Positive Care	Interactions during the appropriate delivery of physical care.	Interactions, which may be expected to make the service user feel safe, secure, cared for or informed as a patient. This is achieved through polite, professional, respectful or good humoured interactions in which the topic is largely determined by staff and restricted to issues of care delivery (E.g. "your discharge"; "your wash"; "your medication"; "your surgery").
Neutral	Brief, indifferent interactions not meeting the definitions of the other categories.	Interactions and which would not be expected to impact on the feelings of the service user, which they would be indifferent to or which they may barely notice. Interactions with no positive or negative aspects
Negative Protective	Providing care, keeping safe or removing from danger, but in a restrictive manner, without explanation or reassurance: in a way, which disregards dignity or fails to demonstrate respect for the individual.	Interactions that may be expected to make the service user feel rushed, misunderstood, frustrated or poorly informed as a patient. Such interactions fail to fully maintain dignity or demonstrate respect due to the focus of staff on doing their 'work'. Staff may appear rushed or task orientated.
Negative Restrictive	Interactions that oppose or resist peoples' freedom of action without good reason, or which ignore them as a person.	Interactions which may be expected to leave the service user feel ignored, devalued or humiliated as a person. Such interactions may be rude, abusive or controlling and pay no regard to the perspective of the patient. Patients expressed needs/preferences are ignored or denied and staff may be authoritative, controlling, rude or angry.

2014). Inter-rater reliability testing was conducted on acute care patients recruited opportunistically. Kappa for QuIS rating was found to be 0.61, indicating good agreement.

Data gathered included the quality, length and frequency of all interactions between participating patients and staff during each observation session. Contextual data were also gathered on the session (number of patients on the ward, staffing levels and skill mix), on the patients (age, gender, evidence of cognitive impairment, agitation at outset of interaction) and on individual interactions (including number of staff, staff type, and content of interaction into seven types as detailed in Table 3). The platform used for data collection was the Quality of Interactions Tool (QI Tool), a tablet-based interface that enables users to enter data in real-time for subsequent wireless upload to an encrypted central database. Data were gathered through direct observation of interactions between patients and staff. Single researchers located themselves in a discrete location near enough to the patient(s) to be able to see and hear interactions. If curtains were drawn researchers stayed within hearing distance but did not enter in order to uphold the privacy and dignity of the patient. Five researchers were involved in collecting data. Each attended a seven-hour classroom training session and four hours of ward-based direct observation training.

3.3. Data analysis

Exploratory data analyses were performed to check the data and identify inconsistencies. Descriptive statistics for patient and interaction characteristics were calculated. Frequencies and percentages were computed to describe the type of interaction and QuIS ratings. Amongst patients with a full two hours of observation, the percentage with at least one negative (either protective or restrictive) was calculated and presented with a 95% confidence interval (CI).

A four level mixed-effects logistic regression model was fitted to investigate the effect of the predictive variables on the probability of an interaction being rated as negative (protective and restrictive combined). The individual interactions recorded between patients and staff were considered as the lowest level of the model. Patient, observation session and ward were included in

the model as random effects making up the higher three levels of the model. Predictive variables were included as fixed effects and presented as odds ratios (OR) with 95% CI. Models were fitted including each predictive variable as a fixed effect on its own (Model A), all predictive variables (Model B) and a selection of predictive variables (Model C). Terms were deemed statistically significant at the 5% level by virtue of the 95%CI around an OR including the value 1.00 or not. Models were estimated using the command xtmelogit in Stata 11.0 (StataCorp.2009.Stata Statistical Software: Release 11. College Station, TX: StataCorp LP). Agreement was assessed by calculating the Intra-class correlation (ICC) for the number of interactions observed. ICCs for agreement in the number of ratings recorded for each category, between the two observers, was also calculated. ICCs were calculated using the one way random model for a single measure in command reliability in SPSS.

3.4. Ethics

Procedures were in place to ensure that the principles of the Mental Capacity Act (2005)(Department for Constitutional Affairs, 2007) were adhered to. Personal consultees were consulted if an individual patient was assessed as lacking mental capacity to decide about whether or not to take part in the study. Any staff, including non-nursing staff, who interacted with recruited patients during the observation sessions were included, unless they declined to participate. Ethical approval for the study was granted by the Social Care Research Ethics Committee for England: study reference number 14/SC/1313.

4. Results

The care of 133 patients was observed over 120 h of planned observation. The intra-class correlation coefficient for the number of interactions recorded by paired observers was 0.94 (95% CI 0.67–0.99, $P < 0.001$). During this time there were 1554 interactions recorded.

Patients and interactions: The mean patient age was 83 years (range 18–101 years). Seventy nine per cent were female ($n = 105$). Thirty-one percent ($n = 41$) of patients had evidence of cognitive

Table 2

Patient and interaction characteristics for all observations. Values are number (%) unless stated otherwise.

Characteristic		
Patients		
Age in years	mean (SD)	n = 133 83 (11)
	min to max	18 to 101
Gender	Male	28 (21%)
	Female	105 (79%)
Cognitive impairment	Yes	41 (31%)
	No	92 (69%)
Interactions/patient/observation session	mean (SD)	12 (6)
	min to max	1 to 41
Interactions/patient/hour	mean (SD)	6 (3)
	min to max	1 to 20
Number of index patients		60 (45%)
Observation session		
Number of patients per registered nurse + health care assistant	mean (SD)	n = 60 3.5 (0.7)
	min to max	1 to 5.7
Number of registered nurse	mean (SD)	4.5 (1.2)
	min to max	2 to 7
Number of health care assistant	mean (SD)	3.8 (1.1)
	min to max	1–6
Skill mix	mean (SD)	0.5 (0.1)
	min to max	0 to 3–0.8
Interaction		
Mood of the patient	Agitated	n = 1554 63 (4%)
	Non agitated	1491 (96%)
Visitors at start of interaction	Yes	100 (6%)
	No	1454 (94%)
Initiator of interaction	Staff	1262 (81%)
	Patient	292 (19%)
Type of communication	One way	232 (15%)
	Two way	1322 (85%)
Cognitive impairment	Yes	529 (34%)
	No	1025 (66%)
Length of interaction in seconds	mean (SD)	101 (190)
	median (LQ to UQ)	36 (14–106)
	min to max	0 to 2337
Number of staff involved	1	1420 (91%)
	2	104 (7%)
	3	30 (2%)

impairment. The proportion of positive interactions was the same for patients with/without cognitive impairment. The patient was not agitated at the outset of most interactions (n = 1491, 96%).

Length of interaction: There was a mean of six interactions per patient per hour (range 1–20) (Table 2). The mean length of interaction was 101 s with a median of 36 s (range 0–2337 s, or 0–39 min).

Interaction rating: Sixty percent of interactions (n = 927) were rated as positive care. In addition, 13% (n = 204) of interactions attracted the rating of positive social. Ten per cent (n = 156) of interactions were classified as negative, of which over half 6% (n = 97) were given the lowest rating of negative restrictive. Forty percent (47; 95% CI 32% to 49%) of patients with two hours of observation (n = 117) had at least one negative interaction.

Initiation of interactions: Eighty-one percent of interactions were initiated by staff rather than patients (n = 1262) and most were two-way interactions, that is the patient and staff member(s) were involved (n = 1322, 85%). Interactions typically occurred with no visitors present (n = 1454, 94%).

Type of interaction: Twenty-eight percent (n = 439) of interactions were classed as functional (including delivery of food and drink, bed-making, documentation and patient transfer), 25% (n = 383) were focused on communication, and 22% (n = 345) were focused on delivery of personal care (Table 3).

Staff and interactions: On average 4.5 registered nurses (RN) and 3.8 health care assistants (HCA) were present on the ward at

the start of an observation session, with a mean of 3.5 patients per RN + HCA (range 1–5.7) (Table 2). Registered nurses were involved

Table 3

Interaction Content: Total Frequencies and Percentages for All Observations in each Category.

Category	Subcategory	Frequency	Percentages%
Functional	Deliver food/drink	181	41
	Hotel services	95	22
	Bed making	89	20
	Documentation	70	16
	Transfer	4	1
Communication	Comfort	100	26
	Information	18	5
	Other conversation	265	69
Personal Care	Using the toilet	97	28
	Eating/drinking	86	25
	Moving/walking	71	21
	Personal hygiene	40	12
	Other Personal care	51	15
Planning	Nursing care	54	40
	Non-nursing care	46	34
	Medical treatment	35	26
Treatments	Medications	94	82
	Other treatments	20	18
Assessments	Vital signs	42	42
	Physical examination	11	11
	Other assessments	48	48
Other	Other	37	100

Table 4

Frequencies and Percentages of QuIS ratings and context for all observations.

	Positive Social	Positive Care	Neutral	Negative Protective	Negative Restrictive	Total
Wards						
A	46 (18%)	127 (49%)	44 (17%)	22 (9%)	18 (7%)	257
B	50 (15%)	196 (61%)	54 (17%)	8 (3%)	14 (4%)	322
C	21 (10%)	116 (55%)	35 (17%)	16 (8%)	22 (10%)	210
D	49 (16%)	205 (66%)	34 (11%)	5 (2%)	20 (6%)	313
E	22 (9%)	144 (57%)	58 (23%)	7 (3%)	20 (8%)	251
F	16 (8%)	139 (63%)	42 (21%)	1 (1%)	3 (2%)	201
Total	204 (13%)	927 (60%)	267 (17%)	59 (4%)	97 (6%)	1554
Individual Staff Group						
Registered nurse	85 (14%)	371 (62%)	77 (13%)	26 (4%)	37 (6%)	596
Student nurse	2 (33%)	1 (17%)	0	2 (33%)	1 (17%)	6
Health care assistant	89 (16%)	363 (64%)	67 (12%)	24 (4%)	29 (5%)	572
Doctor	4 (6%)	43 (63%)	14 (21%)	2 (3%)	5 (7%)	68
Allied health professional	12 (25%)	29 (59%)	5 (10%)	3 (6%)	0 (0%)	49
Other staff	39 (12%)	156 (47%)	105 (31%)	4 (1%)	32 (10%)	336
Cognitive Impairment						
No	133 (13%)	612 (60%)	193 (19%)	42 (4%)	45 (4%)	1025
Yes	71 (13%)	315 (60%)	74 (14%)	17 (3%)	52 (10%)	529
Total	204 (13%)	927 (60%)	267 (17%)	59 (4%)	97 (6%)	1554
Length of interaction						
Less than 5 s	14 (10%)	46 (33%)	74 (53%)	1 (1%)	5 (4%)	140
5 s to <1 min	64 (8%)	517 (61%)	172 (20%)	32 (4%)	69 (8%)	854
1 to <5 min	75 (17%)	300 (69%)	21 (5%)	19 (4%)	21 (5%)	436
5 to <10 min	33 (38%)	48 (55%)	0 (0%)	5 (6%)	2 (2%)	88
10 to <30 min	17 (50%)	15 (44%)	0 (0%)	2 (6%)	0 (0%)	34
30 min or more	1 (50%)	1 (50%)	0 (0%)	0 (0%)	0 (0%)	2
Total	204 (13%)	927 (60%)	267 (17%)	59 (4%)	97 (6%)	1554

in the largest proportion of interactions ($n = 596$, 38%) followed by HCAs ($n = 572$, 37%) (Table 4). Quality of interactions between patients and registered nurses and HCAs appeared to be similar; Seventy six percent of interactions involving registered nurses were rated as positive compared to 80% for HCAs (Table 4). Ninety-one percent of interactions involved just one member of staff ($n = 1420$).

Wards and session level: Wide variation between wards is evident, with negative restrictive ratings ranging from 3 to 18% of interactions on individual wards. Positive ratings (positive social and positive care combined) on individual wards ranged from 65 to 82%.

In the initial multilevel model (Model A) logistic model of predictors of a negative (combined protective and restrictive) interaction (Table 5) increasing age, agitation at outset of interaction, interactions initiated by the patient, one way communication, having two staff involved and a higher total number of interactions as well as some specific types of interaction content were associated with statistically significantly increased odds of negative interaction. For example, as patient age increases by 1 year, the odds of having a negative interaction will increase by 5%. The presence of a visitor reduced the odds of a negative interaction. There was a trend to marginally reduced odds for interactions involving a HCA in comparison to those involving registered nurses, amongst interactions with only one member of staff present. Although a higher number of patients per nurse was associated with increased odds of negative interaction this was not statistically significant. Similarly while a skill mix with a higher proportion of registered nurses was associated with reduced odds of negative interaction this was not statistically significant.

In Model B (Table 5) only interactions initiated by the patient (adjusted OR¹ 5.30), one way communication (adjusted OR 10.70 [5.64, 20.28]) having two or more staff involved (2 staff: adjusted OR 5.86 [2.33, 14.74]; 3+ staff adjusted OR 6.46 [1.45, 28.80]) and a higher total number of interactions (adjusted OR 1.09 per unit increase [1.03, 1.15]) plus specific types of interaction content were associated with increased odds of negative interaction. Interaction activity classified as communication (adjusted OR 2.56 [1.18, 5.54]), personal care (adjusted OR 4.10 [1.84, 9.14]) or “other” (adjusted OR 8.36 [2.42, 28.91]) were more likely to be rated negatively. Associations with staffing levels or skill mix remained non-significant although the magnitude of the non-significant relationship for staffing was increased.

As a secondary analysis we estimated regression models including only patient, nurse and session level characteristics as predictors of quality of interaction (shown in Table 5 as Model C). In this model, patient agitation at the outset of interaction (adjusted OR 5.97 [2.23, 16.01]) was associated with increased odds of negative interaction and having visitors present was associated with reduced odds of negative interaction (adjusted OR 0.24 [0.07, 0.84]).

The estimate of variation from the multi-level model was lowest at the patient level (variance component 0.09) with substantially more variation at the ward level (variance component 1.76), and highest variation at the observation session level (variance component 3.49). In the reduced multi-level model, the variance components at the ward and observation session levels

¹ Adjusted odds ratio [95% confidence interval].

Table 5Multilevel^a logistic regression results: odds ratios (OR) of a negative (combined over protective and restrictive) interaction (n = 1554).

Variables	Model A (each predictive variable on its own) OR [95%CI]	Model B (for all predictive variables) Adjusted OR [95%CI]	Model C (for patient and staff contextual variables) adjusted OR [95% CI]
Patient's characteristics			
Age (per year increase)	1.05 [1.01, 1.10]	1.02 [0.98, 1.07]	1.05 [0.99, 1.10]
Male (vs female)	1.12 [0.27, 4.65]	2.65 [0.39, 18.01]	1.89 [0.42, 8.47]
With cognitive Impairment (vs without)	1.69 [0.73, 3.91]	1.15 [0.53, 2.50]	1.37 [0.59, 3.18]
Patient was agitated (vs non agitated)	5.82 [2.21, 15.31]	2.44 [0.82, 7.26]	5.97 [2.23, 16.01]
Type of staff (when only one member of staff is present)			
Registered nurse (n = 517)	1.00	1.00	1.00
Student nurse (n = 4)	9.51 [0.75, 120.62]	7.56 [0.46, 125.09]	10.99 [0.87, 138.95]
Health care assistant (n = 494)	0.91 [0.54, 1.52]	0.81 [0.44, 1.49]	0.90 [0.53, 1.53]
Doctor (n = 46)	0.97 [0.31, 3.05]	1.33 [0.37, 4.76]	1.07 [0.34, 3.43]
Allied health professional (n = 41)	0.89 [0.22, 3.59]	1.34 [0.26, 6.82]	1.03 [0.25, 4.27]
Other type of staff (n = 318)	1.20 [1.03, 4.98]	0.96 [0.45, 2.03]	1.30 [0.75, 2.27]
Interaction characteristics			
Length of interaction (in s)	1.00 [0.99, 1.00]	1.00 [0.99, 1.00]	
Visitors present (vs no visitors)	0.17 [0.05, 0.59]	0.31 [0.09, 1.09]	0.24 [0.07, 0.84]
Interaction initiated by patient (vs interaction initiated by staff)	7.43 [4.67, 11.85]	5.30 [3.07, 9.16]	
One way communication (vs two way communication)	7.75 [4.64, 12.94]	10.70 [5.64, 20.28]	
Interaction content			
Assessment	1.17 [0.34, 4.07]	1.48 [0.34, 6.45]	
Communication	3.67 [1.93, 6.99]	2.56 [1.18, 5.54]	
Functional	1.00	1.00	
Personal care	3.67 [1.90, 7.11]	4.10 [1.84, 9.14]	
Planning	1.37 [0.56, 3.35]	1.67 [0.60, 4.71]	
Treatments	2.17 [0.81, 5.83]	2.76 [0.85, 8.94]	
Other	20.93 [6.89, 63.59]	8.36 [2.42, 28.91]	
Number of staff in interaction			
1	1.00	1.00	1.00
2	2.14 [1.02, 4.49]	5.86 [2.33, 14.74]	2.65 [1.17, 5.96]
3+	2.76 [0.79, 9.62]	6.46 [1.45, 28.80]	2.26 [0.60, 8.46]
Observation session characteristics			
Number of patients per nurse (per unit increase)	1.26 [0.60, 2.66]	1.60 [0.50, 5.09]	1.02 [0.41, 2.51]
Skill mix (per unit increase)	0.00 [0.00, 4.26]	0.00 [0.00, 45.03]	0.00 [0.00, 5.53]
Total number of interactions for that patient (per unit increase)	1.11 [1.05, 1.18]	1.09 [1.03, 1.15]	
Variance component (SE) [95% CI]			
Ward (n = 6)		1.76 (1.70) [0.27, 11.58]	1.02 (1.00) [0.15, 6.93]
Observation session level (n = 60)		3.49 (1.29) [1.68, 7.22]	1.60 (0.78) [0.61, 4.19]
Patient level (n = 133)		0.09 (0.28) [0.00, 35.59]	0.95 (0.47) [0.37, 2.49]

^a All models include ward, observation session and patient as random effects. Bold results indicate statistically significant at 5% level.

were lower.

5. Discussion

Our findings provide a detailed description of the length, frequency and quality of staff-patient interactions in six UK hospital wards. Staff-patient interactions were frequent but tended to be relatively short. Interactions were mostly positive, but a small yet significant proportion were negative. Forty percent of patients had at least one negative interaction. A number of factors were independently associated with more negative interactions, including being patient-initiated, type of care and number of staff involved. Patient agitation at the outset of interaction was associated with increased odds of negative interaction and having visitors present was associated with reduced odds of negative interaction but only in Model C where no account was taken of the interaction content. Variability was highest at ward and session level, compared to patient level.

Findings on the length and quality of interactions are broadly similar to those reported in other studies, although frequency of interaction at a patient level has not been previously reported (The

Regulation and Quality Improvement Authority, 2015; Westbrook et al., 2011). Findings indicate that length of interaction is not associated with quality of interaction, suggesting that both positive and negative interactions can be accomplished in spite of short contact time. However more frequent interactions were associated with a more negative experience. More research is needed to better understand these patterns.

In contrast to other research, this study did not find that age or cognitive impairment increased the likelihood of a negative interaction (Bridges et al., 2013, 2010; Eriksson and Saveman, 2002; Fulmer et al., 2005). Previous studies have not controlled for multiple patient and staff factors and these findings clarify that age and cognitive impairment do not appear to be independently associated with interaction quality. In Model C, patient agitation at the outset of interaction was associated with higher odds of a negative interaction which adds to our understanding of which patients may be more vulnerable to negative interactions.

The finding that interactions focused on communication and personal care were associated with a higher likelihood of a negative interaction is noteworthy given that communication and personal care are aspects of nursing care in which positive

interactions are regarded as essential for establishing therapeutic relationships (Department of Health, 2010; Department of Health, 2012; Francis, 2013). Qualitative inquiry into interactions during these aspects of care would enable greater understanding of the association found here.

In Model C, the presence of visitors reduced the odds of a negative interaction, whereas having more than one member of staff present increased it. It might be anticipated that staff perform better when under the observation of others (Strauss, 2002), but these findings do not consistently support this claim. It may be that staff become so used to having an audience of other staff that any effect of observation is muted, but they become more conscious of their behavior when visitors are present. Conversation that occurs between staff when more than one is involved in an interaction may result in their being less focused on the patient. Results from the National Inpatient Survey in England suggest that staff talking in front of patients as if they were not there is a relatively common complaint, for example 19% of patients reported this. For doctors the percentage talking as if the patient wasn't there rose to 24% (Care Quality Commission, 2015). Alternatively it may be that with more members of staff involved, the opportunity for at least one of them to act negatively is increased. Visitors appear to have a protective effect, perhaps because staff become more conscious of their behavior when visitors are present. An alternative explanation is that visitors play an active part in improving the quality of an interaction. However, as this finding is only significant when the interaction content is not included in the model it may simply be that visitors are less likely to be present during encounters more likely to be associated with negative interactions, such as personal care.

The high variability associated with sessions and wards compared to patients suggests that common factors operating at these levels are leading to similar quality of interactions. This suggests that there may be factors associated with wards, for example ward cultures, that may influence the quality of interactions. The variability associated with an individual session suggest that factors present in the immediate situation, for example particular stressors or groups of staff, may have the biggest influence. The effects of staffing levels, skill mix or particular staff groups could operate at either of these levels, although we found no evidence of significant associations between these variables and the quality of interactions. However, given the large body of evidence linking staffing levels and skill mix to quality of care (Griffiths et al., 2014) the non-significant trends observed here warrant further exploration. Nonetheless these findings give no support to identify a specific staff group, and in particular health care assistants, as the source of negative interactions and these findings contradict previous largely anecdotal evidence (Cavendish, 2013). The importance of ward and organisational level cultural factors such as the nurse practice environment has also been established previously (Aiken et al., 2012; Maben et al., 2012b; Patterson et al., 2011) and warrants further investigation in future studies with a larger sample of wards.

5.1. Limitations

This study was undertaken on only six wards in two hospitals. The patient mix and ward characteristics suggest that the wards included in this study are typical of NHS general acute care wards (Department of Health, 2013b, 2010, 2000). In addition to the inclusion of a representative proportion of patients with cognitive impairment, the strengths of the study lie in the collection and analysis of data across a wide range of factors and on a large number of interactions, adding valuable understanding about the contextual influences on the quality of interactions between staff

and patients in acute hospital settings. However, caution must be exercised in generalising to other settings. The observational tool used is reliable and is supported by evidence of validity. Using observational methods means that patients who might otherwise be excluded are represented in these findings. However, further validation of the tool to explore its relationship with patient experience is warranted. We focused on the quality and quantity of interactions which occurred. Our study gives no indication of the appropriateness of the content or the extent to which necessary care was delivered. Other studies have shown that nurses frequently omit necessary elements of interpersonal care in the face of low staffing levels (Ball et al., 2014).

6. Conclusion

The findings from this study present a unique insight into the quality and quantity of interactions between staff and patients in acute hospital settings, and into the factors associated with the quality of an interaction. While a high proportion of interactions were positive, the findings also indicate that there is scope for further improving the quality of interactions: even over the short observation sessions a large number of patients experienced one or more interactions characterised as negative by an independent observer. It is unclear how these negative interactions affect overall patient experience of care or whether the overall number, or the presence of any negative interaction is most important. Further work is warranted to explore factors associated with a negative interaction, including workload and ward culture. Ward and session level factors are more important influences on the quality of interactions than patient factors, although our findings do not support attributing negative staff patient interactions to any particular staff group.

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