Title: How does the length of day shift affect patient care on older people's wards? A mixed method study

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Abstract

Background: Internationally, studies have focused on whether shift length impacts on patient care. There are also ongoing concerns about patient care for older people in hospital. The study aim was to investigate how length of day shift affects patient care in older people's hospital wards.

Objectives: 1) To explore how length of day shift affects patient care in older people's wards; 2) To explore how length of day shift affects the quality of communication between nursing staff and patients/families on older people's wards

Design: A mixed method case study.

Settings:
The study was based on two older people's wards in an acute hospital in England. One ward was piloting two, overlapping 8 hour day shifts for 6 months while the other ward continued with 12 hour day shifts.

Participants and Methods:
Qualitative interviews were conducted with 22 purposively recruited nursing staff (17 registered nurses; 5 nursing assistants). An analysis of patient discharge survey data was conducted (n=279). Twenty hours of observation of nursing staff's interactions with patients and families was conducted, using an adapted version of the Quality of Interaction Schedule (301 interactions observed), with open fieldnotes recorded, to contextualise the observations.

Results:
There were no statistically significant differences in patient survey results, or quality of interactions, between the two wards. There were three overall themes: Effects of day shift length on patient care; Effects of day shift length on continuity of care and relationships; Effects of day shift length on communication with patients and families. Nursing staff believed that tiredness could affect care and communication but had varied views about which shift pattern was most tiring. They considered continuity of care was important, especially for older people, but had mixed views about which shift pattern best promoted care continuity. The difficulties in staffing a ward with an 8 hour day shift pattern, in a hospital that had a 12 hour day shift pattern were highlighted. Other factors that could affect patient care were noted including: ward leadership, ward acuity, use of temporary staff and their characteristics, number of consecutive shifts, skillmix and staff experience.

Conclusions
There was no conclusive evidence that length of day shift affected patient care or nursing staff communication with patients and families. Nursing staff held varied views about the effects of day shift length on patient care. There were many other factors identified that could affect patient care in older people's wards.

Keywords

Contribution

What is already known about the topic?

- Length of shifts affects quality and safety of care in general hospital wards.
- Care for older people in hospital should be person-centred and promote staff-patient relationships but is often task-focused.
- Shift patterns may affect person-centred care and care continuity.

What this paper adds

- Nursing staff have varied views about how length of day shift affects patient care in older people's hospital wards
- It is difficult to implement 8 hour day shifts in a hospital where 12 hour shifts are the norm, especially when there are staff shortages and a reliance on temporary staff
- There are multiple factors other than day shift length that could affect patient care and interactions on older people's hospital wards.

1. Introduction

In United Kingdom (UK) health services, older people, defined as 65 years and over (World Health Organisation, 2002), are core service users, comprising 43 per cent of people admitted to UK hospitals non-electively (Oliver et al., 2014). There have been ongoing concerns about the standards of hospital care for older people in the UK and shift patterns are one possible influencing factor. The aim of this study was to explore how day shift length affects patient care in older people's hospital wards. Whilst the study was small scale, the mixed methods design revealed insights about the complexity of changing shift patterns and the multiple influencing factors.

2. Background

Historically nurses have worked varied shifts, but recently long (usually 12h) day shifts have been adopted, driven partly by perceived cost-effectiveness (Griffiths et al., 2014; Harris et al., 2015). Internationally, the prevalence of long day shifts varies. A survey of medical and surgical staff nurses in the United States of America (US) identified the most common shift length as 12-13h, worked by 60% of nurses in non-intensive care wards and 80% in intensive care units (Stimpfel and Aiken, 2013). In Europe, 12h shifts are generally less widespread than in the US. In a survey in 12 European countries (RN4CAST study), 50% of registered nurses (RNs) on medical and surgical wards worked 8h or less on their last shift, 32% worked 8.1-10h, and only 14% worked 12-13h (Griffiths et al., 2014). However, 12h shifts were the norm in Ireland and Poland, while in England, 32% of nurses worked day shifts of 12h or more (Griffiths et al., 2014). UK employment surveys reveal increasing numbers of nurses working 12h shifts (Ball et al., 2015a).

Hospital nurses working shifts over 12h has been associated with increased errors and near errors (Rogers et al., 2004) and there are growing concerns about how long day shifts affect care quality and safety (Ball et al., 2015a). In the US, nurses working shifts of 10h or more were significantly more likely to report poor safety and care quality than nurses working 8-9h shifts (Stimpfel and Aiken, 2013). As the proportion of US hospital nurses working shifts of more than 13h increased, patients' dissatisfaction with care increased too (Stimpfel et al., 2012). In Europe, nurses who worked shifts of 12h or more reported lower care quality and safety than RNs who worked shorter shifts, and they reported more planned care left undone too (Griffiths et al., 2014). Thus there may be unintended consequences of 12h shifts due to reductions in workforce efficiency and effectiveness (Griffiths et al., 2014). However, the

UK's Royal College of Nursing's (RCN) (2012a) surveys revealed that most nursing staff preferred 12h shifts, as they need to work fewer shifts.

Ball et al. (2015a) identified some evidence that 12 hour shifts may have negative effects on nurses and patients, which was mainly related to associated fatigue, but the evidence was weak to moderate quality. In a scoping review of the impact and effectiveness of 12h shifts, Harris et al. (2015) proposed five themes: risks to patients, patient experience, risks to staff, staff experience, and impact on the organisation of work. They found inconclusive evidence of the effects of 12h shift patterns in all five areas but stronger evidence of a negative effect on care quality and safety. A recent review of shift work identified insufficient evidence that 12hr shifts are safe (Dall'Ora et al., 2016). However, studies often did not consider the complexity of shift work characteristics: shift length; weekly work hours; the compressed working week; overtime; night work/rotating or fixed shifts; and rest opportunities (Dall'Ora et al., 2016).

In older people's hospital wards in the UK, 12h shift working increased from 18-33% between 2005-2009 (Ball et al., 2015a). In England, there have been ongoing concerns about standards of care for older people in hospital (Health Service Ombudsman, 2011; Commission on Dignity in older people, 2012; Francis, 2013). In addition, increasing numbers of older people in hospital have dementia (Royal College of Physicians, 2012) and there are particular concerns about the quality of their care (Sampson et al., 2009; Cowdell, 2010; Jurgens et al., 2012; Clissett et al., 2013; Timmons et al., 2016). Person-centred care (McCormack et al., 2008) and relational care (Bridges et al., 2010) are advocated for older people's care and principles include a focus on the individual and developing relationships. For older people with dementia, person-centred care is considered synonymous with best practice (Edvardsson et al., 2010; Clissett et al., 2013) but is not widespread in hospitals (Dewing and Dijk, 2016). Barriers include: short lengths of stay, a task orientated approach and a lack of focus on individuals (Clissett et al., 2013), with other factors identified as being the shift patterns, high staff turnover and weak clinical leadership (Webster, 2011). The ratios of RNs to patients are a further factor affecting patient care and there are lower ratios of RNs to patients on older people's wards in England (Ball et al., 2012). The RCN (2012b) recommended a ratio of 1:5-1:7 RNs per patient in older people's wards but they did not comment on shift patterns.

In summary, the literature indicates that nursing staff shift patterns can affect relational care for older people in hospital (Bridges et al., 2010), and person-centred care for older people with dementia (Webster, 2011). Length of shift is integral to shift patterns but studies have not specifically focused on how day shift length affects hospital care of older people. International studies on shift length and the relationship with patient care have mainly been conducted on general medical and surgical wards and critical care, where many patients are likely to be older, but studies set in hospital wards exclusively for older people appear absent.

The study aim was to investigate how length of day shift affects patient care in older people's hospital wards. The specific objectives were:
   1) To explore how length of day shift affects patient care in older people's wards;
   2) To explore how length of day shift affects the quality of communication between nursing staff and patients/families on older people's wards.

3. METHOD

3.1 Setting

The study took place at an acute hospital in south east England, where full-time registered nurses (RNs) and nursing assistants (NAs), referred to collectively as 'nursing staff', worked
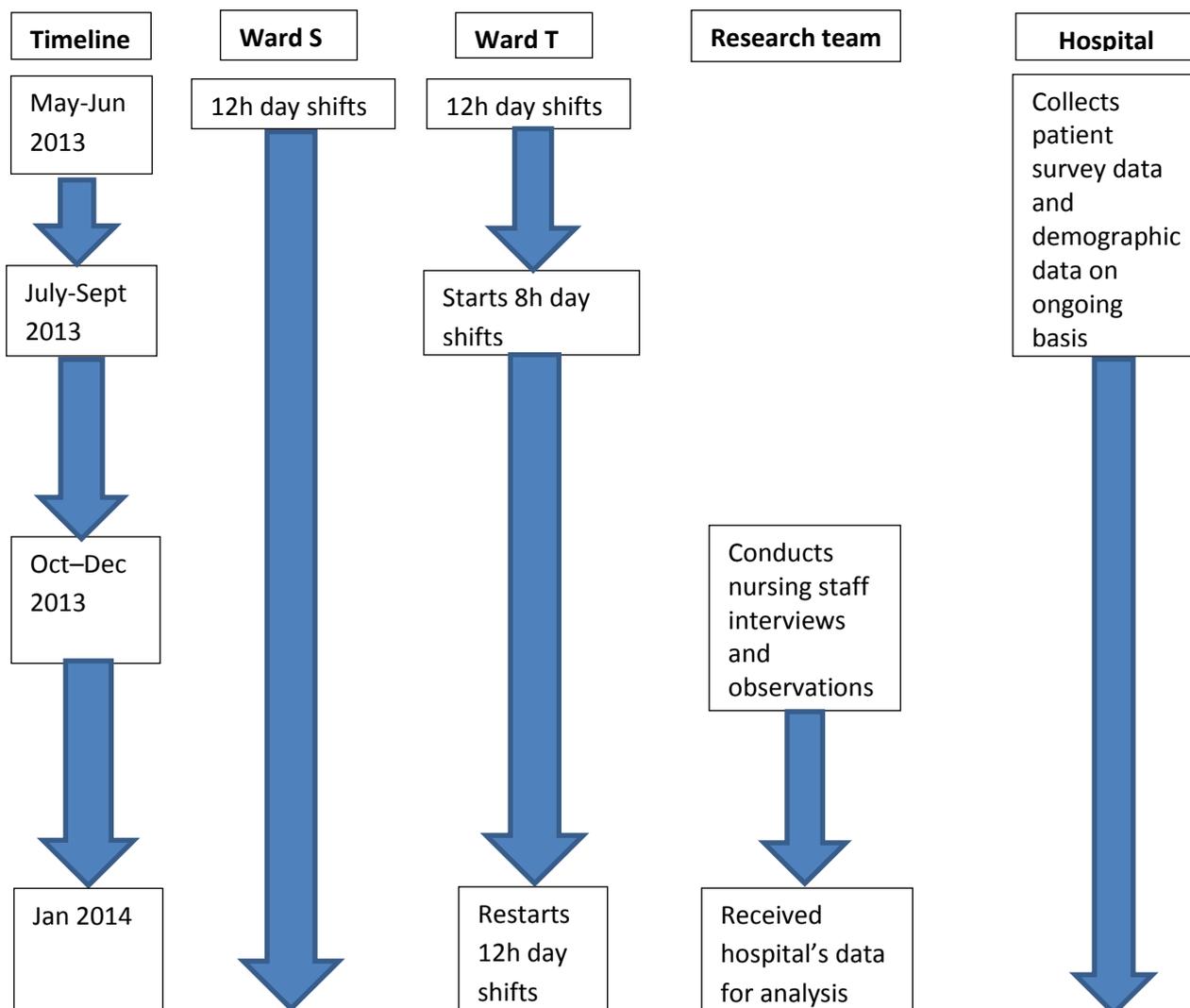
12h shifts, on three days or nights per week. From July-December 2013, one older people's 28-bed medical ward piloted two overlapping 8h day shifts (07.30-15.00 and 12.00 to 20.00) to replace the 12h day shift; the night shift remained the same. The pilot was conducted because the hospital's management team were questioning whether shift length affected patient care, a question reflecting national discourses (Calkin, 2013). Only day shift length was changed as shortening night shifts would have increased the complexity of changing shift patterns. The pilot required additional staff, who were funded by the hospital. Staff who were unwilling to work 8h shifts were redeployed in other wards or on the hospital 'bank', which employs staff to fill gaps on shifts across the hospital. The hospital also regularly used external agencies to supply temporary staff. The research team, from a partner university, were invited to conduct the study after the shift pattern had started, thus limiting availability of pre-pilot data.

3.2 Study design

The methodology was a case study, which is appropriate for investigating a contemporary phenomenon in depth, within a real world context, and addressing 'how' research questions (Yin, 2014). In line with a case study design, propositions were developed from the literature review (Yin, 2014), linked to objectives and data collection methods (see Table 1). Ward S, where nursing staff worked 12h day shifts, and Ward T, where nursing staff worked 8h day shifts, were the cases used to explore how day shift length affects patient care in older people's hospital wards. A mixed method approach was used; in case study design, any data (quantitative and/or qualitative) can be collected as appropriate for investigating the phenomenon (Yin, 2014). The data collection methods were interviews with nursing staff, observation of interactions with contextual fieldnotes, and analysis of patient discharge survey data. The integration of the mixed method findings occurred after initial analysis and during interpretation (Creswell, 2003), when the two cases were compared. The interview and observation data were collected concurrently during the second half of Ward T's pilot (October-December 2013). The patent survey data were provided to the research team in January 2014, along with demographic data for the two wards, as context for the results. Figure 1 illustrates the data collected alongside the Ward S and Ward T shift patterns and a timeline.

Table 1 Propositions, objectives and data collection methods		
Proposition	**Objective**	**Data collection method**
The length of day shifts may affect patient care for older people in hospital	To explore how length of day shift affects patient care in older people's wards	• Semi-structured interviews with nursing staff • Patient discharge survey data
2. The length of day shifts may affect quality of nursing staff communication with patients and/or families in older people's wards	To explore how length of day shift affects the quality of communication between nursing staff and patients/families on older people's wards	• Structured observation of interactions between nursing staff and patients/families with contextual fieldnotes • Semi-structured interviews with nursing staff

Figure 1 Study design: shift pattern and data collection

Timeline	Ward S	Ward T	Research team	Hospital
May-Jun 2013	12h day shifts	12h day shifts		Collects patient survey data and demographic data on ongoing basis
July-Sept 2013		Starts 8h day shifts		
Oct–Dec 2013			Conducts nursing staff interviews and observations	
Jan 2014		Restarts 12h day shifts	Received hospital's data for analysis	

3.3 Nursing staff interviews

Invitation letters with information sheets were circulated to all permanent nursing staff on wards S and T, explaining the project, the interviews and observation episodes. The researchers visited the wards regularly over two months to recruit staff for interviews. Whilst the inclusion criteria were any nursing staff on permanent contracts on these two wards, the researchers increasingly used purposive sampling to include RNs of varied seniority and staff who had worked on Ward T prior to July 2013 and had experienced both 8h and 12h day shifts. Twenty-two nursing staff were interviewed: 12 on Ward T (9 RNs; 3 NAs); 10 on Ward S (8 RNs; 2 NAs). Interviews were conducted in private ward offices using a topic guide, developed from the literature, with open questions and follow-up probes (see Appendix 1). The interviews lasted 20-30 minutes and were audio-recorded with consent; one participant declined so notes were written and completed afterwards.

3.4 Observation

The inclusion criteria for staff observed were that they were on the ward during the observation episode and gave consent. Ten hours of structured observation were conducted

on each ward, during the latter part (17.30-19.30) of five late 8h shifts on Ward T and five 12h shifts on Ward S. The rationale was some evidence (Ball et al., 2015a) that staff tiredness at the end of 12h shifts might affect communication. The researchers were mainly non-participant observers but they interacted socially with patients and families. They used the Quality of Interaction Schedule ('QUIS') tool (Dean et al.,1993) in the adapted version (Health Improvement Scotland, 2012), which is used for measuring person-centred care for older people in acute hospitals and was therefore appropriate for the setting. This adapted version includes three interaction categories (Positive social; Basic care or neutral; Negative) rather than the original five categories in Dean et al.'s (1993) tool. Health Improvement Scotland gave permission to use the adapted tool.

The researchers recorded open fieldnotes to contextualise the interactions and also noted the staffing for each 2h observation period: number of staff and their shift length; RN:NA ratio; and the number of hospital bank or agency staff. The two researchers were aware of the need for reduce any variability in their use of the QUIS tool. They first piloted the tool together, by independently observing interactions in the same ward bay and comparing their interpretation of the three QUIS categories. As discussed by McHugh (2012), if raters are experienced and little guessing is likely, researchers may safely rely on per cent agreement to determine interrater reliability. The researchers discussed any variation in ratings and agreed a consistent interpretation, and then repeated until ratings were consistent. The researchers moved around different ward areas, recording QUIS scores manually for interactions by different nursing staff with patients and families, along with open fieldnotes. After each observation, they entered QUIS scores into Excel and wrote up field notes electronically.

3.5 Patient discharge survey

In April 2013, a new tool to gather patient experience feedback, the 'NHS Family and Friends Test', was introduced in England (Department of Health, 2013). All hospitals must ask patients: 'How likely are you to recommend our ward to friends and family if they needed similar care or treatment?' at or within 48 hours of discharge. The question was modified from a similar question used to test brand loyalty in the private sector (NHS England, 2014). The aim is to produce near real-time data about patient experience that informs public choice and supports service improvement and performance monitoring (NHS England, 2014). The study site hospital included extra questions about patient care and experience. One of these questions 'Did you have confidence and trust in the nurses treating you?' aligned well with person-centred care (McCormack et al., 2008; Brooker, 2007) and relational care principles (Bridges et al., 2010).

The research team requested two extra questions that aligned with person-centred care, for Ward T and Ward S. The question 'Did you feel cared for by the nursing team?' aimed to gain the patient's subjective perspective of their caring relationship with the nursing staff. The other question was: 'Were you regularly cared for by the same nurses?' as .continuity with staff could affect relationships and staff understanding patients as individuals. Due to the logistics of altering the hospital's tool for these two wards, these questions were used only during November and December 2013, so respondent numbers were low. The hospital also added 'Do you think the hospital staff did everything they could to help control your pain?' to the survey from November 2013. The Family and Friends Test was only implemented in the hospital in May 2013 and from July 2013, the Trust's additional survey questions were revised. Therefore, only responses to the question 'How likely are you to recommend our ward to friends and family if they needed similar care or treatment?' could be compared, before and after the introduction of 8h day shifts on Ward T.

All patients discharged were eligible for inclusion. The number of eligible patients could not be accessed for May-June 2013 so no response rate could be calculated. Between July-

December 2013, there were 287 eligible respondents on Ward T, with 119 (41%) surveys completed, while on Ward S there were 342 eligible respondents and 115 (34%) were completed. These response rates were comparable (Ward S) or better (Ward T) than the national average of 34% (NHS England, 2014). Variations in mode of administration of the Family and Friends Test tool, for example, cards or online, at the point of discharge or after discharge, can affect responses (NHS England, 2014; Sizmur et al., 2015). However, at local level, with consistent administration, any biases would be constant and so comparisons between wards and over time are valid (NHS England, 2014). At the study site, the survey was consistently conducted with patients on an iPad at the point of discharge.

3.6 Data analysis

Initially, the different data sources were analysed separately. For the quantitative data (patient survey data and QUIS scores), descriptive statistics of frequencies and percentages were first calculated. Pearson's Chi-Square was used to compare responses of 'Extremely likely' against all other responses combined (Likely, Neither likely nor unlikely, Unlikely, Don't know) for the core Family and Friends Test question: 'How likely are you to recommend our ward to friends and family if they needed similar care or treatment?' The following comparisons were calculated:

- Pre-pilot responses (May-June 2013) between Ward S and Ward T;
- July-December 2013 responses between Ward S and Ward T;
- Ward S responses May-June 2013 against July-December 2013;
- Ward T responses May-June 2013 against July-December 2013.

For the other survey questions used during July-December 2013 (having trust and confidence in the nurses, getting enough help with eating meals) and during November-December 2013 (pain control, feeling cared for and being regularly cared for by the same nurses), the response 'Yes always' was compared against other responses combined (Sometimes and No), between Ward S and Ward T. Pearson Chi-Square was also used to compare Ward T and Ward S's total proportion of Positive social QUIS scores; the Basic care or neutral and the Negative results were combined. A p value of < 0.05 was considered statistically significant. Due to some small cell counts, Fisher exact test was also calculated but there were no differences in levels of significance so only Chi-Square results are reported.

The interview audio files were professionally transcribed and analysed initially by one researcher using the 5 stage framework approach (Ritchie and Spencer, 1994). The transcripts were read for familiarisation and themes noted (stage 1). At stage 2, the thematic framework was developed from the topic guide and themes noted in stage 1. The framework was then applied to each transcript through line by line data coding (stage 3). Charts were then developed to display the data (stage 4). At stage 5, both researchers critically reviewed the charts, clustering codes into categories and identifying initial themes. The researchers then triangulated the results from all data sources and developed overarching themes, by reviewing the observation scores, fieldnotes and patient survey results, within the context of the initial themes.

3.7 Ethical considerations

The study was conducted in accordance with the Declaration of Helsinki. A university research ethics committee gave approval for the study, which was also reviewed and registered as a service evaluation with the hospital's Clinical Audit and Effectiveness department. The researchers had honorary hospital contracts and wore university clinical uniforms during observations, which took place in public ward areas only (i.e. bays and corridors). Due to infection control reasons, observers did not enter areas where patients

were isolated and, for patient privacy reasons, they did not observe behind curtains or in bathrooms. The observers called nursing staff if patients needed help. All permanent nursing staff on both wards completed consent forms before the observation data collection episodes started. The observers rechecked verbal consent with staff on duty during each observation episode. For temporary (agency/bank) staff on duty, the observers explained the study, provided an information sheet, and gained consent. Participants completed written consent forms prior to each interview. No staff declined to be observed but not all staff wished to be interviewed. All data were anonymised and kept securely on password protected, encrypted computers; written documents were kept in a locked university filing cabinet.

4. Results

First the contextual factors are reported, followed by the patient survey results and the Quality of Interaction Schedule (QUIS) results. The themes are then presented using an integrated approach, which draws on any relevant data (O'Cathain, 2009); in this study, these were: interview, observation and patient survey data.

4.1 Contextual factors

The Trust's demographic data for July-December 2013, confirmed that the two wards had similar patient populations in terms of gender (Ward T=38% were male; Ward S=37% were male) and age (Ward T=mean of 84 years; Ward S=mean of 83 years). The mean length of stay was 15 days on Ward T and 14 days on Ward S. During the six month pilot, Ward T experienced considerable staffing changes including, after the first two months, the replacement of the ward manager with an acting ward manager for the next four months. Temporary staff (bank/agency) were present on most shifts on both wards to make up staffing numbers and were sometimes in the majority. On Ward T, temporary staff usually worked 12h rather than 8h day shifts. The research team were informed that agency/bank staff were unwilling to work 8h shifts. All results should therefore be viewed in the context that Ward T was mainly staffed with permanent staff on 8h shifts working with temporary staff on 12h shifts.

The contextual qualitative fieldnotes from the observation episodes highlighted multiple additional factors that could influence patient care and communication. These factors included: acuity of patients; numbers isolated for infection control; patients needing one-to-one care; how many consecutive shifts each staff member had worked and whether they did additional shifts on days off; and the experience and education of the staff. The proportion of staff who were temporary was another striking feature and their individual characteristics varied greatly: they could be external agency or hospital bank nurses, RNs or NAs, and may or may not have previously worked on the ward. Some bank NAs were student nurses who were part way through their degrees and were familiar with the hospital.

4.2 Patient survey results

The question 'How likely are you to recommend our ward to friends and family if they needed similar care or treatment' does not specifically focus on nursing but as nurses are the 24h presence on the ward, responses are likel333y to reflect experiences of nursing care. As Table 2 indicates, there was no significant difference between the proportion of patients who were extremely likely to recommend the ward to family and friends on Ward T, and those on Ward S during either May-June, or during July-December 2013. There was also no significant difference between Ward S's 'extremely likely' result for May-June, compared with July-December 2013 (p=0.829) nor between Ward T's results for the two time periods (p=0.206).

Table 2 Family and Friends Test results: How likely are you to recommend our ward to friends and family if they needed similar care or treatment?

Response	May-June 2013			July-December 2013		
	Ward S	Ward T	Chi-Sq p-value	Ward S	Ward T	Chi-Sq p-value
Extremely likely n(%)	15 (54%)	8 (47%)	p=0.671	59 (51%)	75 (63%)	p=0.07
Other response[1] n(%)	13 (46%)	9 (53%)		56 (49%)	44 (37%)	
[1] Other response included: Likely, Neither likely nor unlikely, Unlikely, Don't know						

Table 3 presents comparisons between the patients' 'Yes always' result for other patient discharge survey questions on Ward S and Ward T during the 6 month pilot and indicates no statistically significant results. These responses are discussed further within the themes.

Table 3 Family and Friends Survey results for additional questions July 2013-December 2013, comparing Ward S and Ward T result for 'Yes, always'

Questions	Yes, always		Sometimes or No		p-value Chi-Sq
	Ward S	Ward T	Ward S	Ward T	
Did you have confidence and trust in the nurses treating you?	104 (90%)	115 (97%)	11(10%)	4(3%)	p=0.052
Did you get enough help from staff to eat your meals?[1]	62 (84%)	47 (84%)	12(16%)	9(16%)	p=0.982
Do you think the hospital staff did everything they could to help control your pain?[2]	13(81%)	24(83%)	3(19%)	5(17%)	p=0.899
Did you feel cared for by the nursing team?[3]	12(71%)	17(53%)	5(29%)	15(47%)	p=0.236
Were you regularly cared for by the same nurses?[4]	5(29%)	12(36%)	12(71%)	21(64%)	p=0.623
[1]Figures exclude those who did not need help					
[2]Figures exclude those who did not have pain; question only asked in Nov/Dec					
[3] Question only asked in Nov/Dec					
[4]Question only asked in Nov/Dec					

4.3 Observation results

Table 4 summarises the Quality of Interaction Schedule (QUIS) results and staffing data for each observation episode, first for Ward T, and then for Ward S. Each episode is identified as 'Obs' with the Ward identifier and a number; Ward T's observations are ObsT1-5 and Ward S's are ObsS1-5. Table 4 presents the number of interactions that were Positive social ('Pos'), Basic care or neutral ('Basic') and Negative ('Neg'), during each observation episode. Table 4 also includes, for context, the nursing staff on duty: the RN:NA ratio, number of staff working 12h shifts, and number who were agency/bank staff. Table 4 illustrates that there was only one Ward T observation episode (ObsT1) with no 12h day shifts, and bank/agency staff often comprised more than half the staff on duty. However, the ratio of RNs to patients achieved the RCN's (2012b) recommendation of 1:5-1:7 on each ward. There was no significant difference in the total number of Positive social interactions, compared with other categories combined (Basic Care or Neutral and Negative), on Ward T (n=114; 73%) compared with Ward S (n=96; 67%) (p=0.261).

Table 4 Quality of Interaction Schedule (QUIS) scores and nursing staff for each observation episode on each ward Pos=Positive Social; Basic= Basic care or neutral; Neg=Negative							
Ward T							
Observation episode identifier	**Interactions Observed N**	**QUIS score**			**Staffing**		
		Pos N(%)	**Basic N(%)**	**Neg N(%)**	**RN: NA**	**12h shift N(%)**	**Agency/ Bank N(%)**
ObsT1	27	24 (89)	1(4)	2(7)	4:3	0	2(29)
ObsT2	26	18(69)	8(31)	0	5:1	2(33)	3(50)
ObsT3	41	34(83)	7(17)	0	6:2	4(50)	4(50)
ObsT4	31	22 (71)	7 (23)	2 (6)	4:2	2(33)	1(17)
ObsT5	32	16(50)	15(47)	1(3)	4:3	4(57)	4(57)
Total interactions observed	**157**	**114(73)**	**38(24)**	**5(3)**			
Ward S							
Observation period Identifier	**Interactions observed N**	**Quality**			**Staffing**		
		Pos N(%)	**Basic N(%)**	**Neg N(%)**	**RN: NA**	**12h shift N(%)**	**Agency/ Bank N(%)**
ObsS1	31	14(45)	17(55)	0	4:3	7(100)	3(43)
ObsS2	24	14(58)	8(33)	2(8)	6:2	8(100)	5(62)
ObsS3	25	17 (68)	5 (20)	3(12)	5:4	8(89)	6(66)
ObsS4	28	25(89)	2(7)	1(3)	4:4	8(100)	4(50)
ObsS5	36	26(72)	9(25)	1(3)	4:4	8(100)	2(35)
Total interactions observed	**144**	**96(67)**	**41(28)**	**7(5)**			

4.4 Themes

Three themes were identified from triangulation of all data: Effects of day shift length on patient care, Effects of day shift length on continuity of care and relationships; Effects of day shift length on communication with patients and families. The interview data, patient survey results (Tables 2 and 3), observation results (Table 4) and fieldnotes are included as relevant. Ward staff interviewees are T1-12 for Ward T and S1-10 for Ward S. The NAs on Ward T were T1, T2 and T12; on Ward S, S2 and S4 were NAs. All other interviewees were RNs.

4.4.1 Effects of day shift length on patient care

Ward T staff had varied views about whether the 8h shifts improved patient care with some positive views: '*It's definitely better patient care'* (T3). However others did not identify benefits to patients (T2) nor perceive that the ward's previous 12h shifts adversely affected patient care (T7). Some Ward T staff expressed that having extra staff during shift overlaps improved care, for example, at lunchtime: '*there are more people getting the food out*' (T1). However, most patients (84%) on both wards reported always receiving help with meals when needed (see Table 3). Patients' responses about pain control drew similar responses on both wards with no significant difference (see Table 3). To the question '*Did you feel cared for by the nursing team?*', 12 (71%) patient respondents on Ward S answered 'Yes, always', as opposed to 17 (51%) on Ward T, but this difference was not statistically significant (p=0.236).

Most staff considered that tiredness affected patient care but there were diverse views about whether three 12h shifts per week, or five 8h shifts, were most tiring. Staff on both wards perceived that shift length, and associated tiredness, must be viewed within the context of

older people's medical wards, which they described as heavy and physically and mentally intense (T2, T9, S6). One Ward S nurse explained how 12hr shifts might have a negative impact:

> *If you are not concentrating and losing your train of thought and just so weary it has got to affect your nursing care I think.* (S6)

Most staff discussed that two consecutive 12h shifts should be the maximum and suggested that staff who found them particularly tiring should work one on, one off.

Some Ward T staff perceived that working five shifts each week was more tiring than 12h shifts and adversely affected care.

> *After a few days it is quite tiring and the patients don't get the best of you if you are tired.* (T1)

Eight hour shifts inevitably led to long stretches of consecutive late and early shifts:

> *This is my seventh short [8h] day in a row. I'm just as tired as if I've done three long days.* (T7)

How tiring the shift patterns were, and any perceived impact on patient care, cannot be isolated from the staff's other commitments; most were juggling family responsibilities around the shift pattern and five shifts each week increased commuting time. Several Ward T staff had reduced their hours so they only worked four days each week, to reduce tiredness.

4.4.2 Effects of day shift length on continuity of care and relationships

Staff on both wards expressed that continuity of staff benefitted patients, particularly when patients were confused, as patients would know the staff and develop a relationship. However, they had varied opinions about whether continuity was better achieved with 12h shifts, where patients had the same staff caring for them all day during three days each week, or by working 8h shifts, where staff worked a shorter shift but on five days each week. A minority of patients responded 'yes always' to the question *'Were you regularly cared for by the same nurses?'*; there was no significant difference between Ward T and Ward S respondents (p=0.623) (see Table 3). The high proportion of temporary staff (see Table 4) could have affected patients' responses. Nevertheless. most patients on both wards responded 'Yes, always' to the question '*Did you have confidence and trust in the nurses treating you'*; there was no significant difference between the wards (p=0.052).

A few Ward T staff expressed that working five days each week helped care continuity: '*patients seeing the same nurse'* (T9) and helped '*build a rapport'* (T3), which staff and patients appreciated:

> *'When you are on a late to an early, you finish with a patient and start with a patient which is kind of nice. […] They [patients] will chat to you and say, 'oh you're here again'* (T1).

Seeing a familiar nurse each day was considered particularly beneficial to people with dementia: it '*builds trust'* (T3). Some staff considered that working five days each week increased knowledge about patients' preferences and promoted relationships with families, for example:

> *'You know the patient, you know the family, you know that she likes tea, she likes porridge, you know that she likes the light turned up, turned on […] you can follow the patient day by day'.* (T4)

However, continuity was only achieved if staff were allocated to the same patients but '*Sometimes you have to change your bay'* (T4); organisation of care during shifts therefore affected continuity too.

Working 12h shifts led to more days off the ward, which could adversely affect continuity: '*there's three days gap that you have missed out on things'* (T4). However, Ward S staff

discussed the benefits of continuity within the day shift as '*you build that relationship throughout the day*' (S2). They emphasised the importance of familiar staff across the day:

> *The patient knows that's who would be the nurse for the day so it's easier to remember the name, if he needs to call for a nurse, rather than have a new face.* (S10)

Several Ward T staff too recalled how 12h shifts, which they had worked previously, supported relationship-building with patients, as they had more time:

> *If you've got your whole day, I think you can find more time to spend with them and talk to them, whereas, I feel so rushed on a short day.* (T7)

They could develop detailed knowledge about the patient (e.g. elimination, mobility, medication), discern subtle changes in patients and knew how best to approach them, for example:

> *When you're a long day you know how the patient's mood is today because some here are very confused. I know how to come to the patient, you must be maybe very smiley, chatty.* (T8)

4.4.3 Effects of day shift length on communication with patients and families

A few Ward T staff perceived that the 8h day shifts meant staff were less tired and might communicate better as they are *'fresher'* (T5). In contrast, one Ward S nurse described that, '*by six o'clock, you've had enough really*' (S1). Highlighting how such tiredness might affect communication, a nurse expressed:

> *I'm sure I give much better communication and empathy and compassion in the morning than I do at the end.* (S6)

However, other staff considered that the 12h shift positively affected communication: '*communication with the patients, for me, it builds as you spend the day with somebody*' (S2). Some Ward T staff expressed that 8h shifts adversely affected communication with families. Early shift staff might talk to the family on the telephone in the morning but would not be on the ward when the family visited later. On a late 8h shift, they did not have the depth of knowledge to have meaningful discussions with families:

> '*I think it's difficult to communicate with the family when you haven't been looking after them [patient] in the morning*' (T5).

Some Ward S staff talked of the advantages of being on the ward all day and being able to talk to the different family members who visited. However, other Ward S staff acknowledged that finding time to talk to families was difficult in the evening as the end of the shift was so busy, a view that concurred with observation fieldnotes.

While there was no significant difference between the overall number of Positive social interactions observed on the two wards, scrutiny of the QUIS scores, the staffing and fieldnotes highlighted possible influencing factors. On a Ward T shift where only 50% of interactions were Positive social (ObsT5), 4 of the 7 staff on duty were temporary and working 12hr shifts. In contrast, on the evening with a high number of permanent staff (5 out of 7) and no staff on 12hr shifts, 89% of interactions were Positive social (ObsT1). On Ward S, on the evening with the highest proportion of temporary staff (ObsS3: 6 out of 9), the fieldnotes indicated a high patient acuity with staff struggling to meet patients' needs. Nevertheless, 68% of interactions were Positive social (see Table 4). However, during episode ObsS1, only 45% of interactions were Positive social, the rest being Basic care or neutral. The observer's fieldnotes revealed that there was a junior staff nurse in charge who was working a third consecutive 12 hr shift as a bank shift, due to staff shortages. The agency RNs observed were focused on complex medication administration, which they accompanied with the minimum amount of communication to carry out the task (classified as Basic care or neutral interactions).

5. **Discussion**

Most studies about impact of day shift length were based on critical care or general medical or surgical wards but the current study focused on older people's wards, which staff at the study site perceived were particularly physically and emotionally tiring. Most studies of 12h shifts have used surveys with few using observation (Ball et al., 2015a). This mixed method case study enabled in-depth exploration of two cases with contrasting day shift length and triangulation of data sources from interviews, survey and observation. Therefore, this study's results may offer other perspectives and inform further work.

As shifts on the pilot ward were rarely covered entirely by staff on 8h day shifts, due to numbers being made up by temporary staff on 12h shifts, no definitive conclusions can be drawn regarding the study's propositions about effects of day shift length on patient care and communication. The study highlighted the difficulties of covering a ward entirely with staff who are working 8h shifts, when staff were accustomed to working 12h shifts, which remained the hospital norm. A high proportion of temporary staff in the ward team is challenging for ward leaders and is likely to impact on continuity of care (Duffield et al., 2009). However, the study site was within an area of England with staffing shortages and it was challenging to fully staff wards with permanent staff. Therefore, both older people's wards used high numbers of temporary staff who generally only worked 12h shifts; insisting on 8h shifts for temporary staff could have led to shifts not meeting the RCN's (2012b) recommended RN:patient ratio for older people's care. Similarly, in the US, nurse executives considered that an insistence on 8h shifts would lead to acute staff shortages because most staff preferred 12h shifts and would work elsewhere (Kalisch et al., 2008).

Whilst the current study focused on how day shift length affects care for older people in hospital, the observations indicated many additional influencing factors, which were captured in field notes but could not be further examined within the study's resources and design. These factors included: acuity of patients and numbers isolated for infection control; the number of consecutive shifts worked and additional shifts worked on days off; the experience and education of the staff; the proportion of staff who were temporary and whether they were RNs or NAs, whether they had previously worked on the ward and whether they were agency or bank nurses. In addition, ward leadership, which has been associated with patient outcomes (Wong and Cummings 2007; RCN, 2012b), changed on the pilot ward but not on the comparison ward.

The case study's original propositions are discussed next.

5.1 Proposition 1: The length of day shift may affect patient care for older people in hospital

Whilst previous studies have indicated that fatigue potentially impacts on the safety of 12h shifts (Rogers et al., 2004; Ball et al., 2015a), in the current study, there were varied staff perceptions about how day shift length affects patient care, due to staff tiredness. Some nursing staff considered that the number of consecutive shifts was as important a factor in tiredness, and any subsequent effect on patient care, as length of shift. However, as staff may prefer the compressed week offered by 12h shifts (Richardson et al., 2007; Health and Safety Executive, 2006; RCN, 2012a), they may express positive views about longer shifts for personal reasons. Richardson et al. (2007) recommended that three consecutive 12h shifts should be the maximum but their study was based in critical care. In the current study, most staff considered that two consecutive 12h shifts should be the most in older people's wards, but sometimes they worked more to cover staff shortages.

In a US survey there was an association found between hospital nurses working shifts of more than thirteen hours and increased patients' dissatisfaction with care (Stimpfel et al.,

2012). In the current study, the patient survey results revealed an increased proportion of patients on the 8h day shift ward who responded 'extremely likely' to the question: 'How likely are you to recommend our ward to friends and family if they needed similar care or treatment', but this increase was not statistically significant. Most patients were always helped with meals if needed and with pain control. However, lower proportions of patients always felt cared for by nursing staff, particularly on the 8h shift ward, though there was no statistically significant difference. Some staff perceived they had more time for patient care on 12hr shifts as they could spread the care over the day. Similarly, Wooten (2000) reported that, on a cardiology ward, nurses on shorter day shifts felt more rushed, especially in the morning.

The importance of relationships for positive experiences in older people's care is well recognised (Bridges et al., 2010). In the current study, staff discussed the importance of relationship building during interviews, but they had varied views about the effect of day shift length. A minority of patient respondents on both wards reported being regularly cared for by the same nurses and the high proportions of temporary staff on both wards could have affected these responses. However, regardless of staffing and shift length, most patients on both wards always felt confidence and trust in the staff. Some staff expressed that having the same nursing staff all day was less confusing for patients and helped build relationships with patients and families. Similar views were identified in the care of older people with dementia in hospital (Clissett et al. 2013) and in critical care (Richardson et al. 2007). Staff getting to know individuals and what is important to them, and their life context, can benefit older people in hospital (Bridges et al. 2010; Dewar and Mackay 2010) and patients in critical care too (Richardson et al., 2007). In the current study, staff recognised the benefits of getting to know patients as individuals and their preferences, in line with person-centred care principles (Brooker 2006), but they had varied views about how day shift length affected getting to know patients.

5.2 Proposition 2: The length of day shifts may affect quality of nursing staff communication with patients and/or families in older people's wards

Staff expressed that tiredness affects communication with patients but had varied views about whether 12h shifts or 8h shifts were most tiring. Some staff perceived that communication developed with patients and families over the 12h shift and that they could better communicate with families about the patient, having been with them all day. The observations revealed no significant difference in numbers of Positive social interactions between the two wards during the last two hours of the shifts, but other factors were observed to affect communication, such as, patient acuity and presence of temporary staff. Social interactions can positively affect older people's care experiences (Stoddart, 2012); most interactions observed were associated with specific tasks, such as medication, meals or vital signs recording, with no social element in some instances. Fieldnotes indicated that temporary staff in particular used Basic care or neutral interactions that were task-focused but overall, few interactions were classified as negative. However, Barker et al. (2016) found that 40% of older patients experienced at least one negative interaction with staff in hospital.

5.3 Recommendations for future research

Future studies could aim to capture the multiple staff factors that interact with the shifts worked and patient care and to include collection of observational data before commencing a new shift pattern. Gaining qualitative data from patients and families about how different shift patterns affect their care experiences, in particular, care continuity, would be valuable and could illuminate survey results. The inclusion of people with dementia would be important as they are a high proportion of patients on older people's wards.

5.4 Limitations

This small, exploratory study involved two wards at one hospital in England, thus limiting transferability. Conducting this study within the changing and uncontrolled environment of an acute hospital with ongoing staffing issues was challenging. The pilot ward was rarely staffed entirely by staff working 8h shifts and there were multiple additional factors that could influence care apart from the shift length. Different results may be obtained with a larger scale study and if studying a ward that achieves 8h day shifts consistently. The lack of pre-pilot data, except for some patient survey data, is a further limitation. Whilst the patient survey data provided an opportunity to compare patient perceptions of care on both wards and prior to the 8h shift pilot, the data sets were small and so the results and their lack of statistical significance must be viewed with caution. Patients who did not complete the surveys may have been frailer thus the most vulnerable could have been excluded, an issue acknowledged by NHS England (2014). No respondent demographic data were collected, which is in line with guidance for the survey to be as simple as possible so data are available in real-time and inform service improvement (NHS England 2014).

6. **Conclusion**

This study explored patient care on older people's hospital wards with different length of day shifts. There was no conclusive evidence that length of day shift affected patient care or nursing staff communication with patients and families. Nursing staff believed that tiredness could affect care and communication but had varied views about which shift pattern was most tiring. They considered continuity of care was important, especially for older people, but which shift pattern best promoted care continuity attracted mixed opinions. The study highlighted the difficulties of introducing 8h shifts in a ward where staff were accustomed to 12h shifts and where use of temporary staff, who mainly work 12h shifts, was extensive due to staffing shortages. The study highlighted many other factors that could affect patient care in older people's wards and inclusion of these should be considered for future studies.

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Appendix 1 Interview topic guide

Ward T	Ward S
• General experiences of 8h shifts • Effect of the 8h shift pattern on patient care • Effect of the 8h shift pattern on staff • Any other effects of the 8h shifts • Any other comments	• General experiences of 12h shifts • Effect of the 12h shift pattern on patient care • Effect of the 12h shift pattern on staff • Any other effects of the 12h shifts • Any other comments