Factors influencing postoperative LOS after fragility hip fracture surgery: public perceptions – a mixed methods study

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Abstract

Background Postoperative patient outcomes after hip fracture are significant to patients and their relatives, clinicians and policy makers. However, little is known about the collective views of these stakeholders on postoperative factors perceived to cause prolonged hospitalisation in this patient population. We aimed to explore individual stakeholders' opinions on factors influencing timing of discharge.

Methods Using a mixed methods approach, healthcare professionals, patients and relatives completed a questionnaire and interviews. The questionnaire consisted of 13 morbidity and non-medical domains on a five-point Likert scale. Participants were asked to rank each item identifying its importance in influencing length of hospital stay; 1 = strongly disagree, 2 = disagree, 3 = neither disagree nor agree, 4 = agree, 5 = strongly agree. Interviews were semi-structured exploring participant perceptions.

Findings Twenty-six participants completed both interviews and questionnaires; three completed questionnaires only. Five themes affecting LOS emerged from interview data analysis; medical conditions, age and frailty, psychological aspects, the recovery process and social issues. There were some differences between the importance attributed by the semi-quantitative rating scales and the qualitative themes generated. Quantitative data suggested medical factors (pulmonary, infectious, gastrointestinal, cardiovascular, neurological, haematological, wound and pain). The interviews however highlighted functional and social aspects of recovery as key for patients and relative participants.

Conclusion Recovery and discharge from hospital following hip fracture is understood by patients, carers or staff to be a complex interplay between medical conditions, psychosocial factors and the practicalities of living with increased dependency. Approaches to improving outcome will need to address each of these domains if they are to be effective.

Background

Improving postoperative patient outcomes after proximal femoral fracture surgery is a priority for patients, clinicians and healthcare policy makers [1, 2]. Health and social care provision costs continue to escalate – forecasted to reach £2.2 billion by 2020 [2, 3]. Approximately 50% of hip fracture patients are over 83 years [4] with one or more pre-existing comorbidity [5], dementia is present in around 30% [6]. These factors exert strong influence on prognosis, treatment and length of stay. Current mean length of stay in acute hospitals in the UK is around 15.5 days [7].

Following hip fracture, around 50% of people are unable to regain their ability to live independently [8], necessitating long-term institutionalisation with undesirable financial and social costs. Historically, outcome measurements have focused on post-operative mortality, morbidity and surgical implant success [9-11]. Rehabilitation, medical complications and delays in discharge are frequently cited as factors preventing discharge from acute care. However perceptions of patients and carers and healthcare professionals (HCP) are likely to differ. Understanding these is essential in order to meet all stakeholders' expectations, ensure delivery of highly cost effective quality care and promote early discharge. This may in turn lead to better recovery, functional capacity and quality of life [12]. Addressing recovery pathways

solely from the perception of healthcare professionals or of patient/carer perception may fail to optimally improve issues impeding discharge.

This study aims to establish patients', relatives' and healthcare professionals' collective views on factors influencing time to discharge following hip fracture.

Methods

The study was conducted as part of a multicentre prospective observational project running at three National Health Service (NHS) Hospitals. However participants for this specific study were recruited from two sites Nottingham University Hospitals (NUH) and University Hospitals of Leicester (UHL). Recruitment was performed between April 2015 and July 2016. Ethical approvals were received from the East Midlands – Northampton NRES Committee – study ethics number 15/EM/0054 and local hospital study approvals were received before study commencement. Study conduct complied with Good Clinical Practice (GCP) standards set forth in the Declaration of Helsinki of 1975 [13].

The study used a mixed methods approach (semi-structured interviews and questionnaire completion) to establish stakeholders' collective views on factors influencing time to discharge following hip fracture.

Study interviews and questionnaire content guide

Domains of importance were drawn from published research, expert opinion of six ortho-geriatric specialists, and previously validated domains of medical morbidity described by the Postoperative Morbidity Survey (POMS) [14] and the cardiac surgery-specific C-POMS [15].

Participant recruitment

Patients were recruited from orthopaedic wards following hip fracture surgery. Patient relatives were recruited during hospital visits. Permission was sought from the relevant patient before their relative was approached. All healthcare professionals involved in direct care delivery to hip fracture patients were eligible for the study. Key inclusion criteria were: patients with emergency admission for hip fracture and capacity to consent to the study; relative or carer of patient with hip fracture. Non-permanent members of staff and patients with in-hospital falls leading to fracture were not included.

Written informed consent was provided by every participant before study activity commencement, following verbal and written explanation of the nature and purpose of the study.

Data collection

Semi-structured interviews were conducted in an acute hospital setting. The interviews included open-ended questions and participants were reassured and encouraged to talk freely about the topic under discussion. While the domains covered remained the same, they were asked in various ways to

participants depending on the participant group. 'Topic guides' and 'probes' were used as prompts, helping to address any omissions and allowing in-depth clarification.

Patients were interviewed during their hospital stay before discharge; relatives were interviewed during their visiting time to the hospital. Interview times were pre-arranged and agreed in advance to suit the interviewees and lasted 15 to 20 min. Healthcare professionals were interviewed during their free time on the days they were on duty. The study interviews were conducted in a private, quiet confidential area.

All interviews were performed by the lead author (TM). Participants were interviewed alone except for two relatives who attended together. Participants were given a brief overview of the interview process to alleviate any anxiety. The aim of the interview was outlined to the participants in lay terms – 'identifying reasons patients remain in hospital after hip fracture surgery and identify which of these factors are important to them'.

The main open-ended question asked was:

- In your opinion and / or experience why do patients stay in hospital after hip fracture surgery?

Prompt statements used; medical reasons, mobility reasons, social and psychological reasons.

Participants were encouraged to speak out about their personal experiences in any order to facilitate terms meaningful to them. Towards the end of the interviews, participants were asked the following;

- From reasons you have given so far which of these do you feel are more important?
- What makes you say that?

We acknowledged the potential challenges associated with recruiting and interviewing frail older adults [1]. Taking this into consideration, our questions were simplified and stream-lined to allow individuals room for self-expression within subject boundaries thereby minimising burden and fatigue [16]. The interview process, questions and prompts were structured in a manner not to overload the participants. Interviews were audio recorded. For five interviews audio recording was not feasible due to the ward environment, therefore extensive field notes were taken. For all interviews, the researcher made reflective field notes to assist interpretation of data [17].

Questionnaire completion

A 5-point Likert scale questionnaire consisting of currently, outlined postoperative hip fracture morbidity outcomes in literature were used. Each morbidity domain statement had a scale numbered 1-5.

Participants were asked to put a cross in the box which they feel best describes how important the statement is in relation to hospital stay and complications after hip fracture surgery where; 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree and 5 = strongly agree.

Data analysis

Recorded interviews were transcribed verbatim by TM before uploading into Nvivo 11.4 software for analysis [18]. Data was assigned nodes within various segments of text. Nodes were informed and constrained by domains derived from prior literature search. The process facilitated reflection and interpretation using aspects from Colaizzi’s analysis framework [19]. Constructed themes were verified by researcher triangulation (TM and Dalal Almghairbi (DA)) before sharing with the rest of the team. Questionnaire data were analysed using R statistical package [20]. Median and interquartile range (IQR) were used to summarise the results, with a median score >3 considered a priori clinically relevant.

Results

Twenty-nine participants were enrolled in the study; 26 (90%) were both interviewed and completed the questionnaire and 3 (10%) completed questionnaires only as they could not identify any particular reason why they were still in hospital. Fifteen (52%) of the participants were health care professionals, 8 (27%) were patients and 6 (21%) relatives. Patient participants’ mean age (SD [range]) was 81 (7 [72 – 94]). Twenty-four percent (7) of participants were males and 75.9% (22) were females (table 1).

Table 1.

Themes

Five key themes and two subthemes were identified from the analysis (Figure 1). Individual themes are presented below with detailed supporting extracts from individual participants. Themes complement each other though there is some overlap.

Figure 1.

Medical conditions

This theme broadly encompasses both medical and surgical complications and its classified further into two sub- themes; comorbidities and post-operative morbidities. Both medical and surgical complications identified include; infections (wound, chest, urine), pain, delirium/confusion, dementia, cardiac issues, bleeding, DVT, blood transfusion, low blood pressure, gastrointestinal (e.g. constipation, ileus).

Pre-fracture comorbidities

The impact of an individual patient’s previous medical conditions as opposed to their current main reason of admission (fractured hip) was one of the key concepts outlined by eight participants. They acknowledged the complex nature of certain medical issues that individuals already have before the fracture. Furthermore, most patients are admitted with multiple medical problems.

“A lot of our patients are elderly with a lot of complex medical problems for example dementia”, NUH 096 (HCP).

“Some of them have high comorbidities unfortunately”, UHL 01 (HCP).

"The fact that they just don't come with a hip fracture, they've got multiple other medical issues going on", UHL 06 (HCP).

Circumstances relating to the current fall and underlying causes of fracture were seen to be influenced by inter-current illness and also potentially undiagnosed or new medical conditions. Once patients are admitted, it's more likely to take some time for other new medical conditions to be fully diagnosed and treated. Even though the hip has been fixed, patients remain in hospitals for other things.

"It can be numerous things that could have gone wrong with them that they may be unaware of any or they could be under treatment with the GP and these are things that actually go wrong more than the main fracture, and that is one of the biggest causes that keep patients in hospital. The comorbidities as we call them. That's what keeps them mainly here", UHL 01.

"One of the reasons could be the reason that caused them to break their hip in the first place. If it isn't like trauma fracture, they could have a back history of falls. They could have medical reasons why they have fallen and broken their hip. They could have heart problems, blood pressure and things like that... They could have poor mobility" UHL 05 (HCP).

Post-operative morbidities

Nearly all participants gave detailed interview reports of factors involving post-operative complications. Complications arising from hip fracture surgery were perceived to be fairly common; significantly prolong hospital stay and a likely cause of patient death.

"If someone has got a chest infection, which is the most common cause of death after hip fracture, normally, it approximately delays discharge for 4-5 days. If original plan was to be discharge them in 10 days, it takes about two weeks", UHL 04 (HCP).

"And other things you have got, infection of the wounds and quite a major one for keeping people here longer is leaky wounds. So that can hold people back because rehab destinations may not take patients with a leaky wound. And chest infections are another biggy", UHL 08 (HCP).

"Some people come in with pneumonia already, or chest infection already or UTI already. Some people get them from us obviously we are catheterising them they can get the infection from that. So infection is a big one as well", NUH 198 (HCP).

"And so we have got cases of developing DVT", UHL 07 (HCP).

Effects of delirium and memory loss;

"In all the medical clinical memory tests she had, they gave her 3 or 5 words and 30seconds later asking her these words she does not remember the words", NUH 202 (relative).

Pain influenced other functional aspect of recovery.

"It hurts" NUH 156 (patient).

"It's painful and unbearable" NUH 157 (patient).

"Because she is in pain and she is not able to function properly", UHL 11 (relative).

"Pain is a big issue, they suffer in pain and don't want to weight bear on it", UHL 02 (HCP).

Age

Age and frailty, particularly from health care professionals' and relatives' points of view, were considered precursors of the fracture itself with further influence on other themes such as medical conditions and recovery process. They reported that most fractures are due to falls, and elderly frail patients are unable to avoid falls possibly as a result of slow reflex/reaction deficit attributed to age. It also limits expected recovery ability performance of patients such that there is an expectation for them to stay in hospital longer.

"Parents stay in hospital to recover and that recovery depends upon age and characteristics of each patient", NUH 202 (relative).

"We are talking about patients 70 plus. They are not the strongest of the patients and unfortunately some of them take a long time to get back from this, sometimes they don't that's why the mortality is high in our wards", UHL 01 (HCP).

"She finds it difficult to function anywhere at 95 years old. I thought she would be here for another two weeks. The state of her and her age", UHL 11 (relative).

Psychological aspects

Concerns of vulnerability, mental well-being and fear of falling were prominent factors. For example, they may result in reduction and avoidance of activities patients remain capable of performing. Consequently the degree of confidence in carrying out daily activities with the inhibition of fear of falling impact considerably on the physical, social and mental status [21].

"If you are living alone, you lose confidence in yourself thinking I might fall over again", NUH 155 (patient).

"Not doing well in themselves, they become depressed, frightened to go home if they are alone", NUH 189 (patient).

"Patients become worried about coping" [at home after discharge] NUH 191 (HCP).

"Some patients it's fear, some patients don't want to go home, some patients are not motivated", UHL 02 (HCP).

While the fear of falling was evident, there was a concern that some patients would not freely express their concerns making it challenging to progress with their discharge plans.

"So if you sit and talk to them, you will find out its probably just fear, but they don't want all the people to see that they are frightened about falling. So all that, can delay their going home", UHL02 (HCP).

Recovery process

Mobility and rehabilitation aspects were considered to be part of the recovery process - where patients have to regain their minimal or baseline ability to perform daily activities of living before discharge. As part of rehabilitation, patients' usual environment might require some modification to assist with post-fracture functioning and serve to reduce the likelihood of future falls. Comparison between pre- and post-fall functioning as related to changes in activities was a concern. There was an expected reduction in flexibility and physical strength and inability to function as well as before hip fracture. Performing simple tasks around the house once discharged was perceived to be going to be a challenge by many participants as a result of stamina and dexterity loss.

"They never quite seem to get back to the same level of mobility as they had before falling and breaking their hip, and that means they cannot look after themselves, or if a patient has a hip fracture and they are from a residential home for example, that can be managed there if they are fairly mobile, then they have a fall they may not be able to get back to the same care home, then you have to get through the process of finding another one, that means a referral to social services assessments etc., and that might take some time", NUH 096 (HCP).

Association between themes;

"We cannot get them out of bed or do much with them in the early stages, so that kind of impact, everything else because they are not mobilising", NUH 197 (HCP).

Social aspects

Compromised social interaction after hip fracture was associated with self-limited activities. This may have repercussions on quality of life by limiting and changing social contacts and/ or leisure activities. Being alone was a huge concern associated with lack of family support.

"We have to look after ourselves, no reason to go home if I can't look after myself", NUH 157 (patient).

"Depends on home situation, if they are going to be on their own they will like it here", (staying in hospital) NUH 158 (patient).

For those who require social care or placement in nursing or residential institutions, the process is perceived to be unnecessarily long.

“Socially it can be difficult for patients who are unable to return back to their homes and needing to have discharge to nursing and care homes, so that can be quite a lengthy process. There have been recently, a couple of patients, who have been having their discharge to complete in the ward and that was because they have behavioural problems, due to cognitive issues and it did feel like most of the care homes don’t want to take these particular patients, and then they stayed in hospital for quite a long time when perhaps they didn’t need to be if there had been a care home happy to assess them out there, but it was about perception. So that’s difficult. Socially people mostly stay because the care agencies at home are not able to provide these packages of care, whether that might be funding needs too”, UHL 06 (HCP).

“And in terms of some discharge destinations, arranging that can take time and obviously you have got to get the whole team input, so if you are arranging a package of care, that’s what usually holds people back most, trying to work out whether it suits everyone”, UHL 08 (HCP).

Variations in aspects of importance

When asked which factors are highly important, of the eight participants who answered the question in detail, six participants pointed out medical reasons were the most important. However, one participant considered all aspects to be of equal importance and one considered mobility to be important. There was a distinct variation in aspects identified by different participatory groups; HCP identified a broad spectrum of factors outlining all themes, while relatives and patients focused more on the recovery process and the functional ability (psychosocial) aspects. They appeared to be more concerned about individual patients' coping abilities after the fracture.

Table 2 shows the overall median scores and individual participating group scores per domain as measured by a 5-point Linkert scale. Eight domains: pulmonary, infectious, gastrointestinal, cardiovascular, neurological, haematology, wound and pain were found to be clinically significant with median >3. There was a similar reflection among individual participant groups, with some discrepancy in agreement on the endocrinology and mobility factors.

Table 2.

Discussion

This study has identified five broad themes that HCPs, patients and their relatives (caregivers) consider important in delaying discharge after hip fracture surgery: a) medical status – pre-fracture comorbidities and postoperative morbidities b) age, c) psychological aspects – fear of falling and anxiety, d) the recovery process – mobility and rehabilitation, and e) social aspects – social care arrangements and discharge destination.

There were some differences between the importance attributed by the semi-quantitative rating scales and the qualitative themes generated. The quantitative data suggested medical factors. The interviews

however highlighted the functional and social aspects of recovery as key for the patients and relative participants. Reduced levels of mobility are associated with fear of falling, physical limitations and social/environmental factors [22]. Death may not be perceived as the worst outcome following hip fracture. One study assessing the quality of life related to fear of falling after hip fracture reported 80% of older women preferred death than experiencing loss of independence and quality of life that resulted from a hip fracture and subsequent admission to a nursing home [1, 21, 23].

The perceptions of our participants are consistent with previous literature. Both medical and surgical complications are associated with mortality and prolonged hospitalisation [4, 23]. A German study that explored factors influencing hospitalisation in similar patient participants observed that surgical complications prolonged hospital stay by 10.8 days [24].

Various qualitative studies that focused on the recovery and healthcare delivery experiences of patients and their caregivers, reported similar domains as outlined in this study. A recent UK study identified mobility, pain and mental wellbeing as factors of importance [1]. The fear of falling again was a very evident aspect identified by most participants. Patients felt vulnerable wondering how they will manage by themselves. HCP recognised the need for patients to gain their confidence, especially those living alone. The impact of age on health status and recovery process was reckoned a surrogate of other factors. One Swedish [25] study reported that patients experiencing unbearable pain during hospitalisation have prolonged length of stay. Another study conducted at a UK teaching hospital identified injury experience, pain experience, recovery experience and disability experience as key themes derived from patients after hip fracture surgery [26].

Social reasons delaying discharge include social service assessment, awaiting package of care, and waiting for placement (nursing or residential care). These aspects have been identified as non-medical reasons for delayed discharge [14, 15]. Recently, variation of patient LOS in hip fracture patients (median LOS varied from 14.9 days to 23.4 days) was attributed to the Clinical Commissioning Group (CCG) which the patient originates [27]. The identified themes are interlinked, e.g., early prompt participation in physiotherapy and mobilisation after hip fracture are clinically significant for quick recovery. However, uncontrolled pain postoperatively can hinder early physical therapy delaying mobility. Conversely, overdose with opioids drugs can also delay ambulation and rehabilitation. The system for referral to the social service team for assessment for social care requirements and or for placement consideration in nursing or residential care varies between organisations. It is often once patients are considered 'medically fit'. As outlined by participants in this study, the process can sometimes be 'complicated and unnecessarily lengthy' – consequently, the patient remains in hospital with no medical issues adding extra costs to the overall healthcare system.

Study Strengths And Limitations

As a qualitative study we studied a limited sample to allow adequate representation of all participating groups recruited from stakeholders whose interests are of great importance in hip fracture care delivery

and postoperative outcomes. A wider sample may have added more depth and breadth, but there was consistency between participants. Although the use of open-ended questions enabled us to identify and explore the views and experience of participants and participants we cannot be certain that sensitive topics or feelings did not remain hidden.

The factors affecting LOS are multidimensional and participant-generated data are affected by personal experience. This subjectivity can create methodological problems including reporting bias. We used a mixed method approach to overcome this challenge. There was some discordance between the semi-quantitative Likert scale responses, and the qualitative themes, with the former emphasising a medical complications model, and the latter giving more weight to psychosocial factors. This probably reflects the strength of qualitative studies in drawing out tacit (hidden) knowledge, whereas agreeing or disagreeing with choices may favour explicit knowledge or socially expected answers [28].

All our patient participants were elderly and frail which could have limited some of their ability to give a detailed account of their views[17].

Conclusions

Recovery and discharge from hospital following hip fracture is understood by patients, carers or staff as a complex interplay between medical conditions, psychosocial factors and the practicalities of living with increased dependency [29, 30]. A model of improving outcomes focussed solely on a medical complications model is unlikely to be fully effective.

Declarations

Ethical approval

Ethical approval was received from the East Midlands - Northampton research committee (REC: 15/EM/0054) and local research and development permission was received from participating sites.

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Conflicts of interest

This work forms part of TM's PhD thesis conducted at the University of Nottingham, which was supported by a grant from the Sir Jules Thorn Charitable Trust. DA was a PhD student funded by Libyan Ministry of Higher Education. HE is a consultant ortho-geriatrician at Sheffield Teaching Hospital. FA is a consultant anaesthetist and formerly Head of Service ITAPS at the Leicester Royal Infirmary. IM is a member of the NICE topic expert group for Quality Standards for hip fracture, Deputy Director of the Health Services Research Centre at the Royal College of Anaesthetists and holds or has held grants from the National Institute for Health Research and the Association of Anaesthetists of Great Britain & Ireland and British Journal of Anaesthesia for clinical studies in hip fracture.

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Key Points

Postoperative patient outcomes after hip fracture are significant to policy makers, clinicians, patients and their relatives. However little is known about the collective views of these stakeholders on unwarranted postoperative factors perceived to cause prolonged hospitalisation in this patient population. Reported factors that affect hip fracture patients LOS include; medical conditions, age and frailty, psychological aspects, the recovery process and social issues.

Tables

Table 1 Characteristics of included participants n=29

		Participation			Participant group		
	Whole population	Interview and questionnaire completion	Questionnaire completion only		HCP	Patients	Relatives
Number n (%)	29 (100)	26 (90)	3 (10)		15 (52) Nurses 8 (28) Doctors 4 (14) Physio 2 (6) OT 1 (3)	8 (28)	6 (21)
Age (mean ± sd [range])	58 ((22) [25-94])	56 (22)[25-94])	78 ((9) [72-84])		38((10) [25-57])	81((7) [72-94])	73((7) [66-86])
Gender Male/Female	7 (24.1) 22(75.9)						
Race n (%)	White 23 (79) Asian/Asian British 3 (10) Black/Black British 3 (10)						
Abbreviations: SD, standard deviation; physio, physiotherapist; OT, occupational therapist; HCP, healthcare professionals; n, number.							

Table 2; Significance of factors influencing LOS after hip fracture surgery as perceived; patients, relatives and healthcare professionals

	Overall Median and (Q ₁ ,Q ₃) IQR		Median by participant group		
Domain/criteria	Median	IQR	HCP <i>n=15</i>	Patients <i>n=8</i>	Relatives <i>n=6</i>
Pulmonary	5	4-5	5	4	5
Infectious	4	4-5	5	4	4
Renal	3	2-4	2	4	4
Gastrointestinal	5	4-5	5	5	5
Cardiovascular	5	5-5	5	5	5
Neurological	5	5-5	5	5	5
Haematological	4	3-5	4	4.5	4
Wound	5	5-5	5	5	4.5
Pain	4	4-5	5	4	4.5
Endocrinology	3	2-4	3	4	3.0
Mobility	3	2-4	2	3	4.5
*Psychological	3	1-4	3	2.5	3
*Social	3	1-5	3	1.5	2.5

Abbreviations: Median >3 was considered significant, HCP, healthcare professionals, IQR, interquartile range, Q1 , first quartile, Q3 , third quartile, *psychological aspects (anxiety, depressions), *social aspects (package of care requirements, awaiting home equipment delivery)

Figures

Figure 1

Identified themes