

ORIGINAL ARTICLE

Framing moving and handling as a complex healthcare intervention within the acute care of older people with osteoporosis: a qualitative study

Margaret Coulter Smith, Fiona O'May, Savina Tropea and Jackie Berg

Aims and objectives. To investigate healthcare staff's views and experiences of caring for older hospitalised adults (aged 60+) with osteoporosis focusing on moving and handling. Specific objectives were to explore the composition of manual handling risk assessments and interventions in osteoporosis.

Background. Osteoporosis is a skeletal disease that reduces bone density and causes increased fracture risk. Incidence rises with age and osteoporotic fractures cause increased morbidity and mortality. It is a major global health problem. In the UK older hospitalised adults are normally screened for falls risk but not necessarily for osteoporosis. As presentation of osteoporosis is normally silent until fractures are evident, it is frequently undiagnosed. Healthcare staff's knowledge of osteoporosis is often sub-optimal and specific manual handling implications are under-researched.

Design. An exploratory qualitative content analysis research design informed by critical realism.

Methods. The purposive sample comprised 26 nursing and allied health professionals. Semi-structured interviews addressed topics including knowledge of osteoporosis, implications for acute care, moving and handling and clinical guidelines. Qualitative content data analysis was used.

Results. Awareness of osteoporosis prevalence in older populations varies and implications for nursing are indistinct to nonspecialists. In-hospital fractures potentially linked to suboptimal moving and handling seemed rare, but prospective studies are needed. Categories of 'Understanding moving and handling as routine care or as a healthcare intervention', with further categories 'healthcare practitioners' capacities and capabilities for dealing with people with osteoporosis' and 'the structural and organisational context for moving and handling' are reported alongside safety, frailty and dependency dimensions.

Conclusions. This study informs moving and handling in higher risk groups such as osteoporosis. Clinical knowledge/expertise is required when adapting generic

What does this paper contribute to the wider global clinical community?

- Healthcare professionals tend to underestimate the prevalence of osteoporosis in the older population and some may be unaware of its implications for acute care.
- Manual handling guidelines are generic and nonspecific for osteoporosis or other musculoskeletal conditions. Nurses' perspectives about moving and handling especially contextual factors should be systematically investigated.
- By presenting moving and handling as a complex intervention, the relevance of a range of theoretical frameworks and different disciplinary perspectives to the study of a fundamental yet often multifaceted intervention such as moving and handling is demonstrated. The strategic, policy-driven, organisational and patient safety requirements of moving and handling need to be balanced with consideration of healthcare agency (or the capacities and potential of healthcare staff) in translating general guidelines into actions for individual patients drawing on knowledge and clinical expertise. The patient experience of the complex intervention also emerges as an important area for further investigation.

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manual handling guidelines to specific patients/contexts. Patients' experiences of moving and handling have received limited attention.

Relevance to clinical practice. Increased focus on musculoskeletal conditions and moving and handling implications is required.

Key words: moving and handling patients, older people, osteoporosis, patient safety, qualitative research

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Introduction

Osteoporosis is a skeletal disease that reduces bone density and increases the risk of fracture (International Osteoporosis Foundation (IOF) 2015). Fractures in people with osteoporosis are often low trauma in origin (National Osteoporosis Guidelines Group (NOGG) 2014, Scottish Intercollegiate Guidelines 142 (SIGN) 2015). The World Health Organisation defines 'Low Trauma Fracture' (LTF) as one that results from 'forces equivalent to a fall from a standing height or less, or trauma that in a healthy individual would not give rise to fracture' (Kanis 2007, p. 13). Approximately 200 million people worldwide are affected by osteoporosis including around 3 million in the UK and 250,000 in Scotland (IOF 2015, National Osteoporosis Society (NOS) 2015). Incidence increases with age and given the expansion in the ageing population worldwide the health burden of osteoporosis is predicted to be a major global problem by 2050 (Cooper 1992). The prevalence of osteoporosis in populations worldwide is even greater than other high-profile chronic diseases (IOF 2015). This research focuses on the implications for frontline healthcare staff of caring for people with osteoporosis in acute settings.

Background (Literature)

Osteoporotic fractures are known to be a major cause of morbidity and mortality; hip fractures are potentially the most ominous type as they can cause acute pain and loss of function, invariably they lead to hospital admission, recovery can be protracted and rehabilitation may be incomplete with many unable to return to independent living (Kanis *et al.* 2013, NHFD 2013, Aw & Sahota 2014). Hip fractures were linked to up to 10% mortality in the first month after fracture and one-third mortality within a year (Roche *et al.* 2005) with adults aged 80 years and over at greatest risk (Haentjens *et al.* 2010). Around 7% of hip fractures that occur in hospital (Foss *et al.* 2005) are often falls

related, and osteoporosis is likely to be an important factor due to its high prevalence in older people.

An increased understanding of the epidemiology of fractures in the older population is crucial for developing effective screening programmes and interventions (Boonen *et al.* 2008, Holroyd *et al.* 2008, Court-Brown & Clement 2009, Rizzoli *et al.* 2014). Common sites for osteoporotic LTFs are the spine, hip, wrist and humerus (IOF 2015). Of the 230,000 fractures per year in the UK attributed to osteoporosis, there are around 120,000 spinal, 60,000 hip and 50,000 wrist fractures (NOS 2013). Vertebral compression fractures are linked to increased mortality after diagnosis (Holroyd *et al.* 2008). Whereas 90% of hip fractures are falls related (Geusens *et al.* 2002, NOS 2013), only 25% of vertebral fractures are linked to falls and many occur during everyday activities such as bending over, twisting or lifting light objects (IOF 2010, Aw & Sahota 2014). Despite being the most prevalent of the LTFs, vertebral fractures are under diagnosed and rates of hospital admission are low (Holroyd *et al.* 2008). Signs and symptoms of multiple vertebral fractures include loss of height, kyphosis and severe back pain across acute and chronic stages (IOF 2010). In addition to reduced mobility and increased fracture risk, the psychological impact can be large, potentially including altered body image, low self-esteem, depression and social isolation (Holroyd *et al.* 2008).

Principles of osteoporosis care are reported in national and international guidelines (Kanis *et al.* 2012, NICE 2012, NOGG 2014, SIGN 2015). Populations at risk can be screened using valid and reliable fracture risk prediction tools (Moorchilot & Masud 2010, Hippisley-Cox & Coupland 2012, Kanis *et al.* 2013). The updated Q Fracture algorithm (Hippisley-Cox & Coupland 2012) was developed and tested in UK populations and is recommended in recent national osteoporosis guidelines (SIGN 2015). Fracture Liaison and Osteoporosis Services aim to minimise risk of fractures and involve nurse specialists in multidisciplinary teams. McLellan *et al.* (2011) provide sustained evidence of the effectiveness of this service model. Knowledge of osteoporosis within the

wider nursing profession may be suboptimal (Berarducci *et al.* 2002). The impact of education interventions on reducing falls and fractures is as yet unconvincing (Giangregorio *et al.* 2007, Cox *et al.* 2008).

'Frailty syndrome' describes patients presenting with an array of signs and symptoms such as decreased muscle function, unplanned weight loss, exhaustion, slow walking speed and reduced physical activity (Fried *et al.* 2001). Frailty may lead to increased falls risk and fractures even without considering age as a factor (Rizzoli *et al.* 2014). Whereas osteoporosis is a disease resulting from disordered bone remodelling and is diagnosed using Dual Energy X-ray scanning (DEXA), frailty describes a phenomenon that is multifactorial. Osteoporosis and frailty can co-occur together leading to increased risk of fracture in the ageing population and there can be an interplay of contributing factors such as reduced mobility due to osteoarthritis, obesity and/or poor nutrition (Rizzoli *et al.* 2014).

Mobility is an aspect nurses are well placed to assess alongside risk of falls. Research into the prevention of falls and fractures in the presence of osteoporosis has mainly focused on nursing or residential home populations (Chandler *et al.* 2000, Sambrook *et al.* 2007). Hip protectors have been tried in at-risk populations with variable results. Devices to monitor people mobilising, such as pressure sensors and radio-pagers, have been examined in acute general medicine populations (Sahota *et al.* 2014), although evidence of effectiveness is lacking. Although these interventions may have a place within optimal care, moving and handling (M&H) has become an area of focus because people with osteoporosis and their relatives have expressed concern that accidental injuries may occur during M&H in acute care (Evans 2010, Brown 2011). In UK hospitals patients are normally screened for falls risk, but the insidious bone loss that occurs in osteoporosis may not be identified. Manual handling guidelines are generic and nonspecific for osteoporosis and so staff may not include it in their risk assessments. Nurses' perspectives about M&H and other contextual factors have not been thoroughly investigated (Kay *et al.* 2015).

Methods

Aim and design

This study aimed to explore registered healthcare staff's views and experiences of caring for older people with osteoporosis in acute care focusing on M&H. An exploratory qualitative content analysis research design informed by critical realism is presented. The critical realist perspective argues that '... social phenomena exist not only in the

mind but also in the objective world and that some lawful and reasonably stable relationships are to be found among them' (Miles & Huberman 1994, p. 4). Here, the intention is to explore phenomena (osteoporosis in older people, and M&H interventions), examine linkages between phenomena and develop constructs that underpin real situations in an effort to identify such 'stable relationships'. When investigating the existence of something that cannot be directly observed, it is necessary to focus on the product or tangible *effects* to devise a viable explanation for a particular *mechanism* that may be operating under particular conditions (Sayer 2000). Theory and observations are interdependent in the critical realist position (Harré 1981). 'Facts' are revealed because a theory is being used to pick out significant items and it is argued this facilitates a process of categorisation (Harré 1981). May's (2013) study 'Towards a general theory of implementation' provided an important overarching framework to progress data analysis, thus placing the concrete observations or phenomena reported within a broader theoretical context.

Definition of terms

'Osteoporosis' is defined according to the European Guidance on Diagnosis and Management of Osteoporosis by measuring Bone Mineral Density (BMD) with DEXA scan (Kanis 2007) and applies to men and women (Kanis *et al.* 2013). 'Osteoporosis' refers to a 'BMD 2.5 SD or more below the young female adult mean (T score less than or equal to 2.5 SD)' and 'established osteoporosis' or severe osteoporosis refers to the same BMD values and adds '...in the presence of 1 or more fragility fractures' (Kanis 2007, p. 61).

A comprehensive definition of 'Moving and handling' (M&H) is used and includes interventions undertaken to assist people to move or change position, including repositioning in bed, transfers from bed to chair or trolley, help to stand and walk and to healthcare staff's selection of M&H aids. It also includes M&H risk assessments carried out by healthcare staff (Hignett 2003, Smith 2005).

'Manual Handling' (MH) is the term used in national and local staff or workplace guidelines and by the UK Health and Safety Executive (HSE 2015).

Research questions

What are healthcare professionals' views and experiences of caring for older adults aged 60+ who are known to have osteoporosis while in hospital?

- What if any are the implications of osteoporosis for M&H?
- Do healthcare professionals perceive that M&H risk assessments for older adults with osteoporosis differ from standard M&H assessments?

- Do healthcare professionals perceive that M&H interventions for older adults with osteoporosis differ from standard M&H?

Recruitment and selection process

The study was advertised using posters and 90 participant information packs were distributed by hand to orthopaedic rehabilitation, acute medicine and medicine of the older units across three acute hospitals. In addition, senior clinical managers distributed an electronic version of the poster to nursing and allied health professional staff. A purposive sample of healthcare professionals was recruited in one NHS Health Board according to the criteria of occupational discipline, age range, gender, years of experience, geographical location while also looking to achieve maximal variation. Participants gave their informed consent and were made aware they could withdraw from the research at any stage, without giving a reason.

Inclusion criteria

- Healthcare staff with professional registration;
- Based in one NHS Health Board in Scotland;
- Involved in the M&H of older adults with osteoporosis in hospital and/or in advising on M&H.

The final sample comprised 26 healthcare professionals from nursing, physiotherapy, radiography (including specialists in DEXA scanning), occupational therapy and included Manual Handling Advisers. The participants were

linked to a variety of acute settings within one Scottish Health Board (Table 1).

Favourable research ethics and National Health Service management approvals were received from NHS Research Ethics SE Scotland REC REF 11/SS/0081 date approved 7/12/11 Protocol v1. NHS Governance 2011/R/OT/02 date approved 16/2/12 Protocol v1. Data collection occurred from May 2012–January 2013.

Data collection

Qualitative data were collected by semi-structured interviews using a predesigned topic guide generated from a review of the literature on osteoporosis and M&H. Healthcare staff's views and experiences of the care of people with osteoporosis; their knowledge of the disease; factors to take into account when assessing risk prior to moving and handling and the selection and application of M&H interventions were explored. Participants were also asked to comment on the strengths and/or limitations of existing MH guidelines for people with osteoporosis in acute care.

The interviews were carried out face to face in private offices or rooms at the participants' workplace or at the university, apart from three telephone interviews. The location selected was according to the participant's preference. The telephone interviews were conducted from a private office at the university with the participant either in a private office at their workplace, or in the privacy of their

Table 1 Participant demographics

	Discipline (n = 26)				Total n = 26
	Nursing (n = 14)	Occupational therapy (n = 5)	Physiotherapy (n = 4)	Radiography (n = 3)	
Gender					
Male	1	1	0	0	2
Female	13	4	4	3	24
Age					
21–30	0	1	2	0	3
31–40	4	1	2	0	7
41–50	7	3	0	2	12
51–60	3	0	0	1	4
Years experience					
0–10	3	2	4	1	10
11–20	5	1	0	1	7
21–30	3	2	0	0	5
31+	3	0	0	1	4
Highest education qualification					
Certificate/Diploma	4	1	0	2	7
Degree	8	3	3	0	14
Masters	2	1	1	1	5

own home. The proposed method for digitally voice recording all interviews was explained to participants as part of the informed consent process. For telephone interviews this entailed the researcher switching to the Speaker Phone option in the secure office. The duration of the interviews ranged from around 40–60 minutes, and all were recorded on an encrypted digital voice recorder. Data collection continued until a clear picture was gained of healthcare participants' perspectives on the acute care of older people with osteoporosis, including M&H, and a plausible explanation could be developed, termed theoretical saturation according to Mason (2002).

All personal data on research participants are held in confidence and stored securely in a locked filing cabinet in a secure office at the University according to the required University Research and Knowledge Exchange Code of Practice, The University Research Data Management Policy and in compliance with data protection legislation. The secure storage of research and personal data and secure destruction of these data after the designated period are the responsibility of the principal investigator (PI). The research participants were assigned a research identity code for use in the anonymised data transcripts, data analysis, the final research report and/or outputs. A master coding document with the research participant's identity and the assigned research code is held separately from the electronically

stored data in a locked filing cabinet in the secure office of the PI. All research data will be confidentially destroyed following completion of the research and after the currently designated 10-year storage period. Quotations from research participants are reported only when it can be ensured that the participant's identity remains confidential.

Data analysis

Unique codes were assigned to participants to protect their anonymity and members of the research team transcribed interviews verbatim at the university site. Data were stored according to the university policy. A computerised data analysis package was used (NVIVO version 9.2, version 10.0, QSR International, Victoria, Australia). Two members of the research team completed qualitative data analysis using a qualitative content analysis approach after Miles and Huberman (1994), Ritchie and Lewis (2003) and Gibbs (2007). Data analysis comprised data reduction, data displays and conclusion drawing or verification, with the coding of data being central to the whole analytic process. Interview transcripts and field notes were analysed line by line and descriptive codes were attached using initial codes derived from the literature review findings (Fig. 1). This framework was further refined as analysis progressed, and coding hierarchies were developed. Tables, matrices and

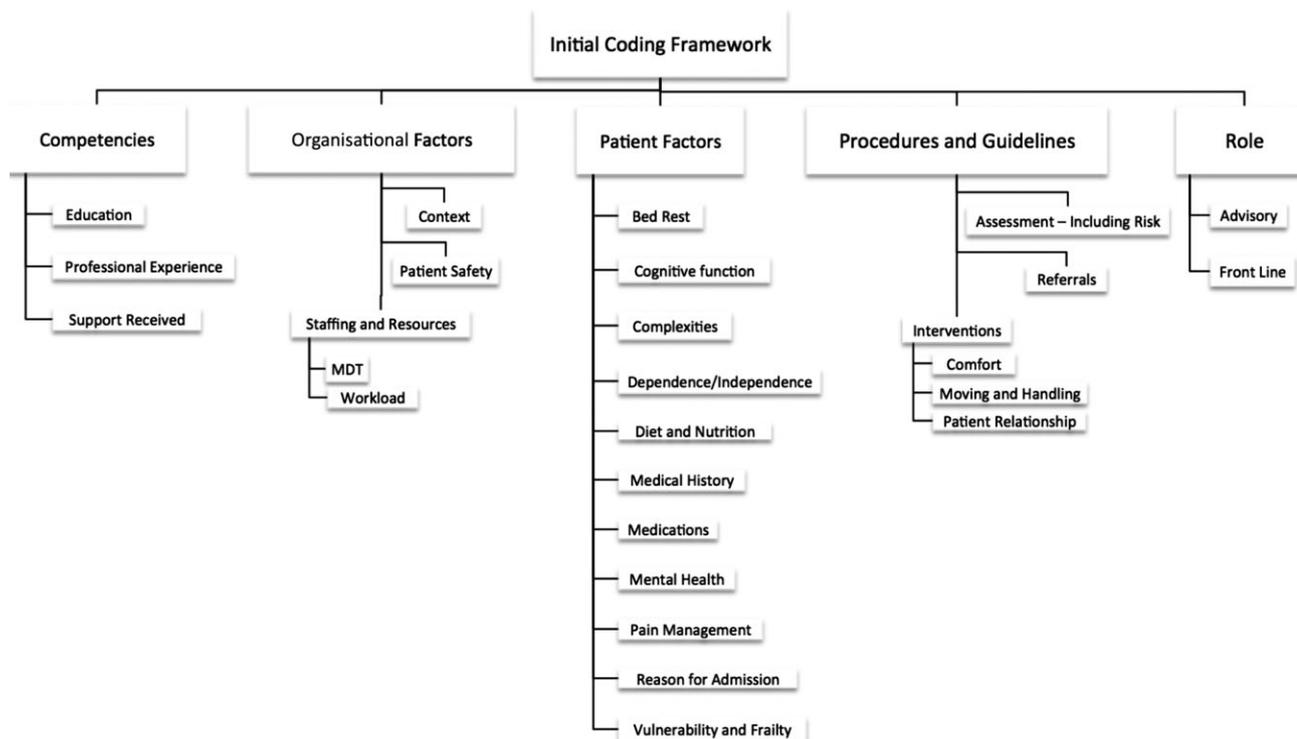


Figure 1 Initial coding framework.

charts were used to organise and display data. Commonalities and differences across cases and events were identified, and contrasting cases explored. Main codes, categories and analytic themes emerged through data analysis (Gibbs 2007, Savin-Baden & Howell Major 2013). Explanations for the patterns observed were proposed by drawing on the research evidence, and from other relevant theoretical evidence (Ritchie & Lewis 2003, Gibbs 2007). Events illustrating differences and commonalities in participants' use of a classification of M&H as 'routine care' or as a healthcare intervention were tabulated. The core category of *Understanding moving and handling as routine care or as a healthcare intervention* was identified, and further subcategories and dimensions were uncovered.

Research rigour

Research quality was addressed by attending to the specific quality criteria of plausibility and trustworthiness (Savin-Baden & Howell Major 2013). An overall goal was to achieve alignment between the research question, the methodology, methods of data collection and analysis, as reported in the previous sections. The data were collected over a period of nine months with no major differences discerned between the data collected in interviews conducted early or late in this period, and participants were dispersed over a wide range of sites minimising opportunities to confer. By recruiting a range of nurses and AHPs from front-line and advisory roles, the goal was to gain a comprehensive understanding of the phenomena of M&H in older people with osteoporosis. As the participants were self-selecting in response to posters and information packs, it is not possible to quantify numbers or reasons for non-participation in this study. This limitation is acknowledged in the discussion (see 'Strengths and limitations'). Of those who responded to the invitation, only one individual was subsequently unable to proceed to interview due to personal research study commitments. This nonparticipant was a male AHP. All others completed an interview, although in some cases dates had to be rescheduled due to workload demands.

Field notes and observations were made during data collection. The digital recordings of interviews were transferred into the research database according to the Research Data Management Policy. Data collection was completed by two researchers (who were both experienced adult nurses), data analysis was completed by one of the former and a social scientist. Credibility and authenticity were further guiding principles throughout the research (Savin-Baden & Howell Major 2013) and the report aims to

supply sufficient information to facilitate judgements of research quality.

Results

The core category that emerged through data analysis was 'Understanding moving and handling as routine care or as a healthcare intervention', with further categories being 'healthcare practitioners' capacities and capabilities for dealing with people with osteoporosis' and 'the structural and organisational context for moving and handling'. The dimensions of safety, frailty and dependency were identified.

Understanding moving and handling as routine care or as a healthcare intervention

Moving and handling in the context of older people with osteoporosis was not something that many participants had previously been asked to consider. Some were aware that osteoporosis was predominantly a 'silent' disease and understood this posed problems for staff. They also recognised that pain, if present, could be linked to fracture, particularly of the vertebrae:

... people don't know they have osteoporosis ... it's not a painful condition, ... But if they fracture, particularly in their vertebrae, it's very painful. (HCP 15)

... I think what people maybe don't appreciate so much, OTs, just how much pain there can be, and I think particularly vertebral pain is a big thing. (HCP 20)

Osteoporosis would not be the main reason for admission, '...we would, not have that information when we are looking at their past medical history, they would not necessarily come in saying this patient has osteoporosis, but we would pick up on that...'. (HCP 11). Some patients might attempt to alert staff to the condition, '... a lot of the time they'll tell you, my hump is getting worse, or I used to be taller, my bones are crumbling, that's their favorite one, they seem to call it "osteoarthritis"...'. (HCP10).

Participants recognised patients with osteoporosis could be located in a range of wards:

This ward is meant to be acute medical rehabilitation, but it tends to sometimes have an awful lot of patients ...who are very, very frail, ...who possibly have osteoporosis...people who have fallen at home and they've fractured something. You feel that maybe the fall hasn't been that hard, but they've still managed to fracture, living at home. There's a classic one at the moment, she's got fractured pubic rami, fractured ribs, you name it, and I would suspect that she's got osteoporosis. (HCP 13)

However, misapprehensions about the prevalence of osteoporosis in the inpatient population were also evident. One participant stated 'I haven't really been involved specifically in handling someone who was like that [*i.e. with osteoporosis*]' (HCP 2) but this is unlikely given its high prevalence. Another commented, 'I can't say "yes" I've specifically had a patient with an osteoporosis issue... that's one amongst other conditions that I've been working with' (HCP 1).

Moving and handling tended to be viewed as part of routine or normal care, but as the interviews progressed and participants referred to the older person with osteoporosis, who might also be frail, layers of complexity were uncovered suggesting a need to examine current conceptualisations of M&H. Some staff may be less aware of how medical conditions can affect patients' ability to mobilise. Of a patient with a pronounced kyphosis one MH Adviser observed how:

...the nurse said to her, to the patient, to stand up straight and she was so cast over. And I thought, she's not going to get much straighter than that because she was so crouched over. And she said "Stand up straight" and I said, she "won't be able to stand up much straighter than that." I suppose [she] was getting her [the patient] to look up to make sure she knew where she was going... she had a zimmer frame, that she was making sure it was at the right height... (HCP 2)

There was, however, a realisation by some participants that conditions such as osteoporosis and/or frailty influenced the M&H intervention. Table 2: Practical adjustments, details specific examples and contrasting cases. One most commonly referred to was the use of a glide sheet. This avoids directly handling the patient; some highlighted how the glide sheet facilitates 'spreading the load' and minimises discomfort. There were examples of where interventions, such as the glide sheet, had to be adapted to the particular patient circumstances:

...patients who are in bed and are not getting up, who are very contracted, and patients who have a curved spine, who lie on their side and they can't lie on their back because their spine is curved, there are different ways of putting the glide sheets in, so we don't actually have to keep rolling them. ... so it's looking at how the patient gets moved, what's wrong with the patient, what is the best way to do things. (HCP 1)

In contrast to the invisibility of osteoporosis, the more visibly obese person with limited mobility living in the community was readily identified as requiring particular care linked to M&H. Such cases were frequently referred to the MH Team as they could require specialist

equipment or they raised staff safety concerns. One participant highlighted '... if the staff are having a manual handling issue with a patient... invariably that tends to be for the heavier patients – not only- but certainly a lot more of our community callouts are for bigger patients' (HCP 1).

Healthcare practitioners' capacities and capabilities for dealing with older people with osteoporosis

The rationale for generic MH guidelines in the context of a complex workforce comprising professionally registered and support staff was widely supported by participants. The MH Guidelines locally covered patient and nonpatient handlers and were aligned to national legislation and policies. Separate guidelines for Therapeutic Handling and Falls Risk Assessment were available. Discipline-specific guidelines for Occupational Therapists and Physiotherapists were mentioned. Participants considered condition-specific guidelines could make care unnecessarily complicated and indicated specific cases could be addressed by referral to the MH Team. However, this would require front line staff to recognise risk and seek advice, but as osteoporosis is 'silent' and often undiagnosed such referrals were rare:

... if you would have to have one [set of guidelines] for osteoporosis, you should have to have one for stroke... you should have one specifically [for each medical diagnosis] and the guidelines very clearly say that if there is any specific issue and they want any support, then you contact manual handling. So whether staff do that, or not, that is a different issue. (HCP 3)

Some participants reflected on the potential development of specific MH guidelines for older people and, if introduced, it was suggested that medical conditions could be highlighted:

I think we've never thought about having... a specific document for elderly care handling, like we do for bariatric handling, or paediatric handling, or midwifery/neonatal handling... if we did, then we would mention conditions like osteoporosis or stroke handling more specifically for these client groups... then we could focus more on osteoporosis clients. (HCP 4)

A number of subthemes emerged including the importance of assessing the person's current clinical state, a clear commitment to developing therapeutic relationships based on trust, the characterisation of staff roles as either frontline and/or advisory and the contrasting focus of nurses' work compared to other allied health professionals.

Table 2 Practical adjustments

Practical adjustments	Selected examples
Minimising the use of direct handling	A lot of my patients are elderly and frail but not osteoporotic, but again <i>I wouldn't over handle them</i> . I think you make a judgement based on your assessment. So, the fact that someone has osteoporosis, yes, you should be aware of it but it shouldn't be the mainstay of "I'm not going to touch them because they're osteoporotic". (HCP 10)
Recognising people at greater risk of LTF	Several participants referred to the use of 'open hand holds', 'being gentle with all patients' as you don't know who has osteoporosis, and 'minimal handling' when caring for older people. In cases of suspected or confirmed severe vertebral osteoporosis, 'rolling people onto their vertebra would be avoided' wherever possible. 'Pulling' or 'dragging' movements were considered hazardous ... some people you are aware that they are very fragile – not that you're humphing people around and all of that, but <i>you are aware that the least thing ... even sitting down heavily in a chair, could result in a fracture [in osteoporosis], so ... if someone's balance wasn't very good, you would have to always make sure they were supported, so they're not just going to fall back in the chair</i> like that (illustrates with a gesture). (HCP 20)
Advising people about safer ways to move	...So it's about <i>encouraging them to move in a better way and not twisting</i> , because sometimes they twist when moving from the bed into their chair which ... if it's severe osteoporosis it could cause a fracture. (HCP 19)
Specific therapeutic handling techniques that would be avoided in people with osteoporosis	A physiotherapist trained in therapeutic handling techniques said '...we wouldn't do 'overpressure' with someone with osteoporosis. We would not do any manual techniques, any mobilizations, any manipulations, anything like that'. (HCP 16)
Assessing capability and promoting independence	...It's very much looking at what the person can do. We look at different things – we see <i>can they do a sit to stand</i> for instance, looking at <i>can they lift their legs when they are sitting down</i> . Have they got <i>sitting balance</i> , because if you've not got sitting balance, you're not going to have <i>standing balance</i> ? Can they lift their feet up, because if you can't lift your feet up...? When I first started nursing, I would stand somebody up, but just because they can stand, it doesn't mean they're going to move. So it's very much a different <i>assessment to see what they can do</i> . And again, <i>asking patients to help pull on bed rails to help roll themselves over</i> . And again, ...what you are seeing there, <i>are they helping you, have they got the ability to help you</i> , and again it's back to that same [thing], <i>keeping [them] as independent</i> as they can be. ... [We used to] do it for the person, rather than waiting for them to do it, [back then the emphasis was on] being taken care of... (HCP1)
	I think in terms of frail elderly the other thing is... there's a tendency to always assist, and too many hands can often make someone feel very anxious so I would always suggest that you let them try by themselves, as long as they're safe. Safety is of paramount importance, but don't over handle because there is that tendency to give support, the patient expects it from you, they get tired, and then we're in a sticky situation, or you try to help and they don't like it, they will become more anxious. (HCP 10)
	Most participants referred to giving people 'time to move themselves' and 'not rushing' them.

Patients often presented with dynamic clinical states. The assessment of the person's 'current clinical state' was apparently considered more important than the medical history in M&H contexts. They typically described this as '... treating what you see, it's not treating a condition, so it's related to the whole person's presentation' (HCP 10). There was an awareness that people '... may well be able to stand in the morning, but by the evening time they ... need a bit of equipment to help. So that's where the assessment comes in, ...what you could do at one point isn't what you can do at

another' (HCP 1). The consequences of such rapid changes in physical states in acute care was voiced and, '... if ... you ... are starting to stand somebody who then is taken ill, and you are sitting them back down, that is safer, so if you are doing that right, that patients' safety should be hand in hand [with the procedure]...' (HCP 3). Risk assessments were mandated before each moving and handling activity:

Any movement is a risk, really, and I think that's one of the things that we're very strict on is that every time you move a patient, you

Table 2 (continued)

Practical adjustments	Selected examples
Safe moving and handling for older people with osteoporosis and supporting and positioning to maximise comfort	<p>Some speculated as to why ‘<i>controversial manual handling techniques</i>’ persisted:</p> <p>... I would like to think that if someone understood that glide sheets are there to reduce friction, then they would use them appropriately ... If they are lying in bed, there is friction there, there, and there, so then I know that this glide sheet is there to reduce that friction then I need to put it in under these points, but when you don’t see that happening at times I suppose yeah... what is difficult is to figure out why, why are they not doing it? <i>Is it because there is not equipment, so they have not got a glide sheet, or they are not using them, or is it because they don’t understand that that is what the gliding sheet is for? Do they think it is just to make their life easier, whereas actually a lot of the equipment, a lot of the manoeuvres that we show them, the guidelines that are all there for the handler they are ultimately for the patients too, because you know if we are handling them well and indirectly and whatever then you are not putting the patient at risk, so that patient safety is “the patient is safer”, or if you are using the appropriate equipment then the patient is safer than if you are not using it. (HCP 3)</i></p> <p>Nurses would be:</p> <p>... making sure they are well supported cos quite a lot of the time they are here and they are stuck in that position and [it is important] <i>trying to make sure they are still well supported</i>. So yes so give them advice ... <i>showing them [staff] about the pillow arrangement ... different pillows the proper way and especially if they are kyphotic and the thoracic spine is affected...</i> (HCP 14)</p> <p>Now that I’m in manual handling, I’m thinking a lot more of the physical handling involved, so you would have to take things fairly gingerly... if somebody was in pain, of they had curvature of the spine, really going at their pace. Making sure they’ve got the correct chair that is comfortable for them, that they’re comfortable in their bed, using the right walking aids... (HCP 4)</p> <p>Nurses and DEXA technicians highlighted the importance of ‘pillows’ to support and assist with positioning for procedures</p>
Contrasting cases: Gesture or command	Where somebody was asked to ‘stand up straight’ when this clearly this was impossible due to kyphosis. (HCP 2)
Potentially inappropriate use of colloquial terms in a professional context	Older and frail people were occasionally likened to ‘Wee birds’, ‘Wee old ladies’, Little birds’
Focus on safety rather than promoting comfort	... there’s a principle of ... this is a safe guideline for you as a therapist, or a nurse, so you don’t injure yourself, and it’s safe for the patient. So safety is the biggest thing to moving and handling. I have to admit I don’t think comfort gets emphasised so much. (HCP 15)

must risk assess them. So I may write one thing one day, overnight they might be unwell – develop a urinary tract infection, be very confused, deteriorate significantly. (HCP 10)

Healthcare professionals worked within the recommended MH Guidelines and recognised these as the foundation for safe and effective practice and yet, they often brought more to their practice than knowledge of implementing guidelines.

There was a belief that the quality of the relationship was important in moving and handling. One participant remarked, ‘...it goes back to the trust bit...because they’re scared, because they’re so high risk, and they’re scared that something is going to break if you move them the wrong way, or if you are too quick’ (HCP 5).

Moving and handling roles were either frontline or advisory, or a mixture of the two. Distinctions between

'routine' care handling and 'therapeutic' handling were highlighted, with physiotherapists and occupational therapists being competent in both types. The nature of nursing work was contrasted with AHPs' work, with the latter apparently having greater control over scheduling, planning and delivering interventions compared to nurses:

... I feel really bad saying this, [the difference] between nursing and therapy staff, is that ... the nursing staff have less time, ... sometimes they have more time, but by and large, they don't have enough time, so everything is done quite quickly, and whereas when we're with patients, it's a therapeutic time, so it's not again going to the toilet – that might happen because they have agreed to go to the toilet at the same time, ...of course, you would just become involved in that – but primarily, you are there to observe. You've allotted maybe half an hour, and so you are there to do an intervention, so you have the time to think about that, and because you are trying to see if the patient is doing as much for themselves, it's not a means to an end. (HCP 15)

Nurses' interactions with patients were often of short duration due to multiple and frequently unpredictable demands. Such pressures led to reactive rather than predictive modes of care delivery. Generalist or specialist type roles within the various disciplines seemed to influence descriptions of their respective M&H responsibilities. So, whereas AHPs focused on delivering targeted, planned interventions for therapeutic purposes, the nurses often engaged in more reactive care handling tasks to meet immediate physical needs.

The structural and organisational context for moving and handling

MH guidelines were primarily focused on maintaining safety, and it was assumed that what was safe for staff would also be safe for patients:

... there's a principle of ... this is a safe guideline for you as a therapist, or a nurse, so you don't injure yourself, and it's safe for the patient. So safety is the biggest thing to moving and handling. I have to admit I don't think comfort gets emphasised so much. (HCP 15)

Accidental injury sustained by patients linked to M&H was not reported as a major or recurring problem, although some indicated their awareness of a link between falls and in-hospital fractures. One participant stated '...I'm not aware of fractures during mobility, not during assisted mobility. However, if a patient is assessed as being a falls risk, there have been [cases of in-hospital fractures], unfortunately...'. (HCP 12). A few reported that LTFs could in some cases be related to M&H interventions. Some

reported rare cases of pathological or spontaneous fracture, but these were not obviously linked to inappropriate M&H by healthcare staff:

... a couple of years ago there was an injury of a patient, but again it was... nobody was physically [assisting with] moving and the patient had gone through to the toilet and sat and then fallen and then fractured their elbow by knocking it, but that was a pathological fracture. (HCP 11)

Media reports about accidents with patient lifting equipment were cited. '...you think [the hoists] it's pretty innocuous, but use it wrongly, there's been quite a few serious incidents where hoists have been used incorrectly, using the wrong size of sling, not putting in supports for the head,...patients have got agitated and ...launched themselves out, there's actually been a few fatalities down South' (HCP 24). The potential for adverse events was thought to be greatest if practice deviated from the techniques recommended in MH guidelines. Rather than the protocol being at fault this was viewed as '...a problem with people thinking it's quicker to do something else and that's their responsibility. So if you choose to make that judgement then you face the consequences eventually' (HCP 10).

Patient safety systems were used to record MH incidents, falls and fractures, with monthly reports generated. Injuries to staff were apparently more prevalent than injuries to patients. One participant commented that the incident reports are '...usually about staff that have hurt their backs doing lifting as opposed to a patient' (HCP 2). In addition, balancing a rehabilitation focus with patient safety was an ever-present consideration. The example below raises questions about whether falls should be viewed as just an unfortunate outcome or an unacceptable failure in M&H:

... I think in my experience of nursing, a lot of the patients' injuries are if they have had a fall. I've had a few people who have fallen and they have ended up with hip fractures and things, which isn't nice. You feel so responsible, but you know,... if you work in Rehab., falls are an unfortunate part of working in rehabilitation with the elderly, ... you do your best to make it as safe as you can, but if you're trying to get somebody back mobile it is a ...risk factor. (HCP 2)

The importance of a positive organisational culture relating to M&H was emphasised. However, the combined effects of a demanding workload and the prevailing organisational culture may in some cases result in new staff conforming to suboptimal local practices to 'fit in':

So whether the staff do not have time to reflect on their own handling, or I think often it's the culture, maybe, in the areas? ... you know the culture of "don't worry, you're moving that patient

fine”, or “you can manage by yourself”, “you don’t need two”, “you can get them up the bed without bringing in the hoist”... I think if there’s a culture whereby handling isn’t maybe seen as a priority, then it won’t be by any new staff coming in, they may come in with good intentions, maybe a newly qualified staff nurse, but then he or she quite quickly fits into that culture... [and] goes along with the common [practice]... (HCP 4)

Workplace competency-based MH assessments had recently replaced formal MH assessments in a classroom setting, a development that was viewed positively by participants. The MH advisors were able to assist staff in translating generic MH guidance to the needs of the specific patient population and context, or from dealing with the general to the particular, an issue that is addressed in the discussion. ‘... we had the moving and handling facilitators in assessing all the team in the ward to make sure that we were following correct procedure and giving us guidance... so I think yeah, [we’re] happy ...’ (HCP11).

Discussion

Multiple theoretical perspectives, operating at a range of levels, are relevant to our understanding of M&H. These include ergonomics, body mechanics, medicine, social systems, social cognitive theories, law, organisational psychology, patient safety, healthcare agency and theories of philosophy, of personhood and of the self. The researchers adopt a critical realist perspective in this analysis of M&H as a complex intervention and view causation through the constructs of structure, mechanism (conditions or other mechanisms that act on the main mechanism) and the effect or event (Sayer 2000).

The research findings provide insights into issues arising in moving and handling in older people with osteoporosis. First, MH operates within a highly regulated and top-down, policy-driven structure. Second, healthcare agency (the actions staff can take to achieve positive things) has not yet been fully recognised or effectively operationalised. Third, the complex nature of M&H practice, including the relationship between general guidance, the particular context and the person who is the focus of the intervention. Fourth, the relationship between the healthcare professional and the patient is not currently emphasised and, finally, the patient perspective has received little formal attention.

Moving and handling is part of the healthcare social system and is located at a strategic level in the healthcare organisation structure. Without exception participants agreed the guidelines needed to be generic and accessible to a diverse workforce. Participants understood the

importance of compliance with legislation (The Health and Safety at Work Act 1974, and Health and Safety Executive (HSE) Legislation covering Musculoskeletal Disorders (HSE 2015), and requirements for full engagement with robust systems of mandatory MH training (Scottish Government, 2014).

There was a strong emphasis on adhering to generic M&H guidelines. Some practitioners seemed reluctant to acknowledge guidelines could require adaptation or adjustment to particular contexts or persons with a specific medical disease or needs condition, such as osteoporosis or frailty. Others appeared more aware of their clinical judgement and decision-making skills when applying principles of M&H. Healthcare staff working in a specific context and with an individual patient are required to consider the relationship between the general (principles) and the particular (the context and the person). They need to engage in a process of continuous assessment of the patient and of the context, to make judgments and decisions drawing on relevant clinical and practical knowledge, and to apply principles flexibly and dynamically. This also meant that healthcare professionals could use their professional expertise, and present themselves as positive role models for others.

Patient safety was high on everybody’s agenda. There were isolated reports of LTFs in older people with osteoporosis in the data, but the study design limits what can be inferred, or if they were linked to M&H techniques. Patient safety monitoring systems are operational and improving, although accurate reporting of LTFs co-occurring with osteoporosis remains complicated due to the silent often hidden nature of the disease and/or absence of diagnosis (IOF 2015).

Organisations could be missing opportunities to fully mobilise healthcare staff agency and create the conditions whereby staff are encouraged to apply relevant professional knowledge to particular situations, such as the older person with osteoporosis. Biomedical knowledge and skill in clinical assessment, judgement and decision making are particularly important in acute care. Unfortunately, knowledge about osteoporosis and its treatment among frontline staff tend to be suboptimal (Lau *et al.* 2010). The application of cognitive and behavioural processes, the various capabilities of healthcare staff and how the social system operates would all be important areas to investigate in depth.

The M&H intervention was the mechanism of interest in this study and the findings highlighted its complexity, particularly with regard to osteoporosis for some groups of people. This had been translated in some cases into the formulation of more specific guidelines (as for example for

bariatric patients and for children). However, for the older and possibly frail person with osteoporosis who is at increased risk of fracture, the process of adaptation of the recommended guidelines to the context and person depended on the different healthcare professionals' background, awareness of the medical condition and also on their level and area of expertise. Participants in our study were not in favour of generating more condition-specific guidelines as they considered their 'ease of use' important (May 2013). A large observational study in Canada provides important insights into the complex problem of increasing frailty in females over 50 years, risk of falls, fractures, death and overnight hospitalisation (Li *et al.* 2014), and healthcare staff now have access to a rapidly expanding research evidence base to inform practice.

Furthermore, participants signalled different ways of conceptualising M&H practice distinguishing it as 'routine care' or 'therapeutic handling'. In 'routine care handling' the focus is on meeting the patient's specific needs (i.e. going to the toilet, eating meals or getting dressed) (*the moving and handling task is a means to an end*); whereas within 'therapeutic' handling the therapists' focus on the specific moving and handling action (i.e. the transfer, the standing or the walking itself) (*the moving and handling task is a means in itself*). Most participants in this study were nurses involved in 'routine' handling and some (physiotherapists and occupational therapists) were competent in both. This emphasises how the healthcare professionals' interaction with the patient is framed by their specific role.

A further factor linked to types of M&H is the very different nature of 'work' according to the healthcare professional's discipline. Nurses' work was characterised as disjointed and reactive to the person's immediate needs compared to AHPs' interventions that were preplanned, of longer duration and mainly proceeded without interruption. Westbrook *et al.* (2011) reported compelling evidence of fragmented nursing work where on average nurses undertook over 70 tasks per hour lasting an average of 55 seconds.

Locally, MH Training was in transition from a formal classroom-based competency model to undertaking competency assessments of staff within practice settings. Study participants commented positively on this development. MH Advisers were able to assist staff in translating generic guidelines to the particular problems of the specific needs of the person, and to address some of the complexities of moving and handling for particular groups. This suggests change is underway and rather than being perceived as routine care and almost exclusively as an injury prevention strategy for healthcare staff, moving and handling is being

re-cast as a complex healthcare intervention in which the perspectives of both healthcare staff and of the person requiring the intervention are important. This might reflect a growing awareness of healthcare professionals' expertise and the need to focus on the 'means' by which they make themselves and others accountable for practice, a phenomenon that May (2013) terms 'relational integration'. Such a dialogue could also lead to greater appreciation of the cognitive and behavioural skills that staff apply when adapting generic guidance to particular contexts and complex interventions, as in the care of older people with osteoporosis.

The relationship between the healthcare professional and the person requiring the M&H intervention is an area for further exploration. Some referred to the need to build trust when forming therapeutic relationships in the context of M&H. They referred to a paradigm shift towards greater integration of rehabilitation approaches in acute care, with many acknowledging the transformation from doing everything for the patient, to promoting their independence. The M&H interaction is based on mutual trust and respect, on the ability to communicate effectively with the person in a way that makes the intervention safe. Safeguarding of dignity is a critical feature of professional practice 'dignity is humanity...it requires time and is experienced only in a context of empathy and mutual confidence' (Lohne *et al.* 2010, p. 301).

When faced with complexity, rigorous theoretical frameworks can act as guides when seeking to build knowledge. Within M&H it is important to balance the various systemic and organisational concerns with the capabilities and capacities of healthcare staff and the needs, values and aspirations of the people in our care. Theoretical contributions within Implementation Science informed the current analysis of the phenomenon of M&H, a core area of activity in the acute care of older people. May (2013) refers to key components of a 'general theory of implementation' that draws on Normalisation Process Theory and theoretical contributions from sociology and psychology. By focussing on healthcare agency investigating how staff select the most appropriate intervention, and exploring how they access dynamic parts of the system (both social-structural and social-cognitive resources) to achieve goals, it becomes possible to pin-point areas of complexity and address these pro-actively. May (2013) focuses on the implementation processes for '...embedding of new ways of thinking, enacting and organizing practice' and when introduced into a social system '...it is formed as a complex bundle – or better...an 'ensemble' – of material and cognitive practices'. What seems to be a simple implementation process can

have multiple dynamic parts and this leads May (2013) to define the object of any implementation process within a healthcare system as a 'complex intervention'. This view accords with 'complex interventions' defined as interventions comprising a number of interrelated parts, and normally being nonpharmacological (RDS-SC NIHR 2015).

Strengths and limitations

This study examined M&H, a fundamental aspect of healthcare. This is presented as a complex intervention when focused on older people with osteoporosis in acute care. Theoretical insights are gained by aligning findings from this study with a general theory of implementation (May 2013). The limited focus in the current MH system on healthcare agency or on the patient at the centre of the complex intervention was noted. The research methodology section traces the processes used and data analysis is supported by rich data extracts to address research validity. Although generalisation is not the purpose of this qualitative study, the clear links to theory and the level of detail included suggest that others may be able to draw parallels with other groups in acute care where the M&H implications may not yet be clear.

The nongeneralisability of findings is accepted as a study limitation. The relatively small sample of self-selecting volunteers in one health board in Scotland means that the findings should be viewed tentatively. Importantly, staff may be reluctant to report poor M&H practice, although this did not prevent some participants from offering historical examples. The difficulty of tracking accidental injuries including LTFs in acute care is acknowledged. Future research with larger samples over more sites would be helpful. Focusing on an area of acute care that is dynamic and one in which progress is being made reflects the real world of practice where interventions may be modified even as data collection occurs. A few developments in practice occurred during the conduct of this study. These included the publication of updated MH Guidelines, an increased focus on osteoporosis within MH training sessions and clinical audits of the incidence of in-hospital LTFs with results broadly in line with elsewhere.

Conclusion

This study investigated healthcare staff's awareness of osteoporosis and the M&H needs of older people with osteoporosis in acute care. An argument has been made for framing M&H in older people with osteoporosis as a complex intervention. The findings illustrate the need for healthcare staff to be aware of the prevalence of

osteoporosis, to always act as if osteoporosis may be present and they underline the need for continuous assessment and planning of M&H interventions. Local MH guidelines are generic and comprehensive, but there is scope to focus on the adaptation of generic guidelines to the particular context and patient, healthcare agency, the person's experience of the process of care and the effects of the intervention for particular groups of people and disease states, such as osteoporosis. The healthcare agent is required to judge the situation well, respect the personhood of others, decide on the right course of action and adapt practice to the individual (rather than simply performing a task or a duty).

Relevance to clinical practice

This research indicated that participants had an understanding of osteoporosis, but they tended to underestimate its prevalence in the older population. There is clearly scope for improved epidemiological knowledge about this disease and a need to debate implications for practice, particularly M&H. Rather than introduce more specific manual handling guidelines, the participants' highlighted the importance of applying clinical knowledge in decision making and especially when formulating patient risk assessments. The accurate assessment of the clinical state or condition of the patient requires staff to be aware of common medical diagnoses and presenting conditions in the acute care population and integrate this knowledge into their practice in M&H. Experienced healthcare professionals who supervise less experienced and/or unqualified staff have an important education role in raising awareness of osteoporosis, its prevalence, increased fracture risk and implications for care.

By drawing on the complex healthcare intervention literature, it becomes clear that particular attention to healthcare agency is crucial in the drive to improve patient care.

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Contributions

Study design: MCS, ST, JB; Data collection and analysis: MCS, FOM, ST, JB; Manuscript preparation: MCS, FOM, ST.

Conflict of interest

No conflicts of interest.

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