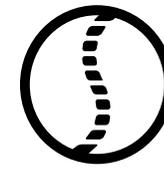


Final Report for The Lydia Osteoporosis Project



LYDIA
OSTEOPOROSIS
PROJECT





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Final Report for The Lydia Osteoporosis Project

*Sharing Research and Education Focused
on Moving and Handling and Older People
with Osteoporosis in Acute Settings*

Project Team:

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Tribute to Lydia

Lydia is a name to reflect all my aunts who suffered from Osteoporosis.

The main inspiration for the project came from my aunt whose right arm was fractured while being moved and handled by an agency night nurse who was trying to pull her into a more comfortable position. She suffered from Osteoporosis for approximately 30 years and was lovingly cared for by her husband. I remember she never travelled without her pillows.

The quote from Florence Nightingale came to mind from *Notes on Nursing*

*The first requirement in a hospital is
that it should do the sick no harm*

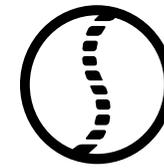
I thought what would an agency nurse need to know about Osteoporosis both in theory and in practice before starting a shift on an unfamiliar acute ward?

I would like to take this opportunity to thank those who embraced this project with excitement from the start, and enabled the project to go ahead at Queen Margaret University. I would also sincerely like to thank Dr Margaret Coulter Smith for her dedication through many challenges to this complex research and education project over four years.

I hope that this project leaves a lasting legacy to Lydia and all those that suffer in silence with Osteoporosis. In the future my hope is that Osteoporosis will be prevented, or at least diagnosed earlier, so that suitable treatments and care plans can be instigated.

My wish is that from this project Nursing and other Allied Health Professionals will be more knowledgeable about moving and handling of patients with Osteoporosis, and be able to practise person-centred care.

THE FUNDERS 21st May 2016



LYDIA
OSTEOPOROSIS
PROJECT

Project Acknowledgements

Grateful thanks to the NHS Healthcare staff and patients who participated in the project. Thank you also to the many individuals who provided guidance and support to the project team particularly NHS senior managers, specialist manual handling, osteoporosis and falls prevention clinicians, Professor David Reid, Professor Stuart Ralston, Dr Donald Farquhar (Consultant Physician), Mrs Anne Simpson (formerly Development Manager for the National Osteoporosis Society, Scotland), Mrs Jackie Berg (Osteoporosis Nurse Specialist), the two anonymous independent NHS Ethics reviewers, Mrs Rowena Wilson (Project Administrator), colleagues across various divisions and departments within QMU especially Mrs Catherine McClintick and Mr Andrew King for assistance with development of Manual Handling videos and the Learning Technologists Mr Dave Cheseldine, Mr Denny Roberts and Dr Susi Peacock for advice on specifying website requirements. Our thanks to Planys Mobile, the IT company contracted to design and develop an interactive project website. We are also grateful to the Senior Management Team at QMU for their support during the project, to Professor Brendan McCormack, Head of Division of Nursing, and the Marketing Team at QMU for their guidance and delivery of an impressive World Osteoporosis Day campaign in 2015. Thank you also to the external and internal members of the project steering group. And finally, our very sincere thanks go to the private anonymous benefactors whose generous donation and vision made the work possible.



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Osteoporosis

Osteoporosis ("porous bones", from Greek: στέον/osteon meaning "bone" and πόρος/poros meaning "pore") is a disease of bones that leads to an increased risk of fracture. In osteoporosis the bone mineral density (BMD) is reduced, bone microarchitecture is deteriorating, and the amount and variety of proteins in bone are altered.

About the Project

The overall aim of The Lydia Osteoporosis Project (LOP) was to increase awareness of osteoporosis amongst frontline healthcare staff and in particular to investigate the implications of this disease for moving and handling practice. The focus was on the care of older adults in acute care settings.

The project adopted an exploratory sequential multiple-methods design comprising four distinct phases commencing with research to investigate healthcare professionals' and patients' perspectives on osteoporosis and moving and handling. This prepared the foundation for phase two, an education intervention feasibility study comprising a workshop and pre/post-test evaluation study. Phase three involved the design and development of education materials followed by the launch of a complex education intervention. Phase four focused on project dissemination including the design and launch of an interactive project website and a final evaluation.

Data collection for phase one commenced in June 2012 and the final project evaluation phase was completed in February 2016. This report documents the main project findings. Further details are available in project publications.

KEY MESSAGES

The Lydia Osteoporosis Project focuses on increasing frontline staff's awareness of osteoporosis and the associated increased risk of fracture.

Many patients will not know they have the condition and staff cannot easily tell because diagnosis requires specialised tests.

The Lydia Osteoporosis Project seeks to enhance care by reducing risk of accidental injury to people with osteoporosis as could happen during moving and handling.





'If we have eggs in our shopping we take even more care when packing our shopping, similarly for moving and handling practice with older people. We need to 'think about osteoporosis' in moving and handling activities and always treat the person as if the condition is present – just as we would if we always had eggs in our (shopping) basket!'

(BBC Radio Scotland, M C Smith responding to Ken McDonald on World Osteoporosis Day, 20th October 2015).

Introduction & Key Points

WHY FOCUS ON OSTEOPOROSIS?

Osteoporosis is a disease that attacks bones with the spine being the most frequently affected, followed by the hip, wrist, and other sites. It alters bone structure, bones become more 'porous', bone mass is reduced, bones become more fragile and people affected are at increased risk of low-trauma fractures (NOS 2015, SIGN 2015). Low-trauma fracture refers to fractures involving minimal force comparable to a fall from a standing height or less (Kanis 2007).

HOW BIG A PROBLEM IS OSTEOPOROSIS?

Osteoporosis is a common bone disease that affects over 3 million people in the UK (including 250,000 in Scotland) and accounts for around 300,000 fractures per year (Age UK 2015, IOF 2015, NOS 2015). Osteoporosis rates increase with age and in the context of a rapidly ageing population in the UK and elsewhere, the overall numbers will continue to rise. Indeed medical specialists refer to an impending 'osteoporosis epidemic' as around 50% of people aged 75 and over are affected by osteoporosis. Globally osteoporosis is a large public health issue. Although it is commonly viewed as a disease mainly affecting postmenopausal females, it can strike many others in the population and the non-modifiable, modifiable and other co-existing disease risk factors are well documented (SIGN 2015). For example, recent robust evidence shows it affects older males in significant numbers giving rise to an increased risk of hip fracture and often poor health outcomes especially in males over 75 years (Haentjens et al 2010). As this disease is often 'silent' in its presentation until fractures occur, it is frequently underdiagnosed in the general population and as a result people may not gain access to treatment until it is well advanced.

HOW DOES OSTEOPOROSIS IMPACT ON PEOPLE'S HEALTH?

Osteoporosis is associated with higher rates of poor health and increased risk of death (IOF 2015). A serious consequence of osteoporosis is the increased risk of low-trauma fracture with hip fractures linked to osteoporosis incurring most of the negative health outcomes and financial costs. Hip fractures disproportionately affect older people who may live alone hence the need for a strong focus on post hip fracture care in current healthcare systems. Osteoporosis of the spine can cause acute, severe and/or chronic back pain as well as curvature of the spine due to spinal compression fractures and potentially a loss of height. A range of other physical symptoms can be experienced. Fear of falling and causing further fracture can lead to people becoming increasingly isolated and reluctant to leave their homes and in turn this can have a negative impact on physical and mental health. Osteoporosis is a complex disease to manage medically. After diagnosis people in the UK normally remain under the care of experienced doctors and osteoporosis nurse specialists. Physiotherapists, occupational therapists, pain specialists and dieticians also have important areas of expertise to contribute in the management of this disease.

At the public health level there is a great need to target strategies to improve bone health across the lifespan. Screening for osteoporosis and fracture risk is extremely important as with early diagnosis and prompt initiation of medical intervention (and with rapid advances in treatments being the result of exemplary interdisciplinary and specialist research) the disease can be more effectively managed. The WHO FRAX Tool (Kanis et al 2005; 2008) focuses on the prediction of fracture risk. The Garvan Fracture Risk Calculator (Joop et al 2010, Moorchilot and Masud 2010) has been shown to accurately predict fracture risk in older hospital patients. An updated Q Fracture algorithm was tested in a large prospective open cohort study in primary care populations in the UK and performed well in the prediction of osteoporotic and hip fracture (Hippisley-Cox & Coupland 2012).

Principles of osteoporosis care focus on the assessment of fracture risk and the use of pharmacological and non-pharmacological interventions to minimise future fractures in at-risk populations (NICE 2004 and 2008, SIGN 2015). Overall, the goal of treatment is to minimize the risk of fractures and the poor health outcomes that can result, especially in the case of hip fracture. We also know that early intervention can substantially improve quality of life for people with osteoporosis. Nursing and Allied Health Professionals all have important roles to play alongside medical colleagues, including in the identification of people at risk, referral for diagnosis, delivering Fracture Liaison Services (FLS) (McLellan et al 2004), promoting physical activity, providing advice on symptom management and helping people to live well with the disease. In addition to accessing effective drug therapies, patients can receive advice on diet, vitamin D and calcium supplements, exercise and balance, falls prevention and hip protectors (NOGG 2000).

USEFUL LINKS (accessed 1st May 2016):

www.nos.org.uk

www.iofbonehealth.org/

www.sign.ac.uk/pdf/SIGN142.pdf

www.nice.org.uk/guidance/cg146

WHY IS KNOWLEDGE OF OSTEOPOROSIS IMPORTANT FOR FRONTLINE HEALTHCARE STAFF?

A number of studies have focused on non-specialist healthcare staff's knowledge of osteoporosis and have employed education interventions (Colon-Emeric et al 2007, Giangregorio et al 2007, Cox et al 2008, Vered et al 2008). Evidence to date suggests that knowledge of osteoporosis in frontline healthcare staff is limited and implications of the disease for patient care requires further exploration. In older people with osteoporosis low-trauma fractures (i.e. fractures that occur as a result of forces equivalent to a fall from standing height or less) tend to be linked to falls. Healthcare staff therefore need to be aware of fracture risk during mobilising and take steps to minimise risk whilst also maximising rehabilitation potential. Vertebral fractures tend to have a different presentation to hip fractures, often being picked up when people are investigated for other health conditions. Apart from radiological evidence, cardinal signs and symptoms of multiple vertebral fractures include loss of height, severe kyphosis and severe back pain across acute and chronic stages (IOF 2010). Osteoporosis is a complex condition and due to fragility of bones in severe disease fractures can result from minimal pressure or happen spontaneously. When engaged in moving and handling interventions it is argued that all healthcare staff need to be mindful of increased fracture risk due to bone fragility in this patient population (Coulter Smith et al 2016). An emerging area of research in the care of older people focuses on the condition of frailty (Rizzoli et al 2014). Whilst osteoporosis and frailty can co-exist in older people, they are not synonymous clinical states and this is important for clinical assessment purposes as people with severe osteoporosis could be overlooked because there may be no obvious visual cues to its presence. The former refers to a disease process whereas the latter describes a multifactorial phenomenon or condition.

The Project Design

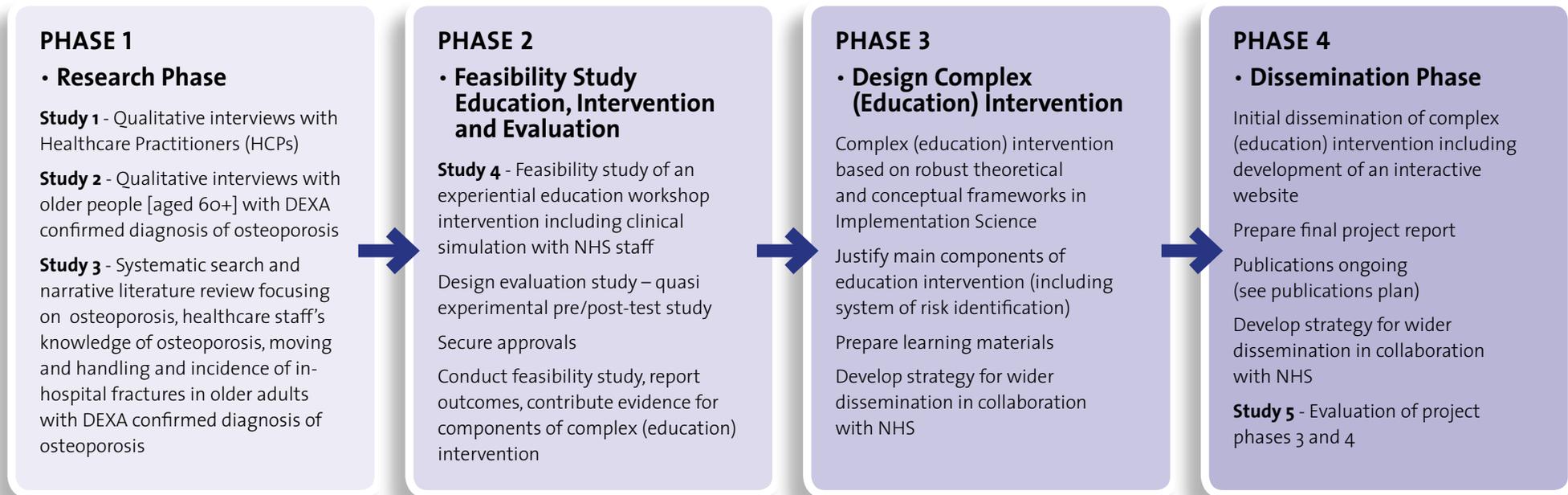
An exploratory, multi-phase, multi-methods project was undertaken (Blaikie 2007, Teddlie and Tashakkori 1998 & 2009). Phase one (research) investigated experienced healthcare staff's views and experiences of caring for older people with osteoporosis and explored the perspectives of patients with a confirmed diagnosis of osteoporosis about receiving care. The findings informed the design of an education intervention and evaluation feasibility study in phase two. This led to phases three and four, comprising the design of a complex education intervention for implementation, wider dissemination of project findings and an evaluation. An overview of the project design is provided in Figure 1 (see below). All necessary NHS management and research ethics approvals were secured prior to each phase commencing¹.

¹: NHS Research Ethics and Management Approvals references 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. Phase 1. University Research Ethics and NHS Clinical Governance Approval gained for phase 2, Autumn 2013, University Research Ethics Phase 4, dated 10th January 2016.



Members of the Project Team

Figure 1: The Overall Design for the Lydia Osteoporosis Project



The Aims and Objectives of the Lydia Osteoporosis Project (LOP)

AIMS:

“To reduce the potential risk to people with osteoporosis of accidental injury linked to moving and handling, by increasing awareness of osteoporosis and increased fracture risk, and improving staff’s knowledge and skills through education and research.”

OBJECTIVES:

- To investigate the moving and handling needs of older people with osteoporosis in acute care from healthcare staff and patient perspectives;
- To undertake scoping searches and a narrative review of the literature²;
- To raise awareness of the prevalence of osteoporosis and the nursing care needs of people affected by osteoporosis through an education intervention feasibility study (education workshop for healthcare staff);
- To disseminate project findings and to highlight features of an innovative complex education intervention for frontline staff and others using an interactive website and other media;
- To complete a final stakeholder evaluation based on feedback received at the Stakeholder Conference and through an online survey.

² The literature review demonstrated that a separate project objective to develop a risk identifier was not justified as robust fracture risk screening tools were available including the FRAX, GARVAN Fracture Risk Calculator and Q-Fracture tools.

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, Kanis et al 2013).

- Patients can be classed as having normal BMD, low BMD (osteopenia), osteoporosis and severe osteoporosis (Kanis 2007). This research focuses on the latter two categories.
- ‘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)’ (Kanis 2007).
- ‘Severe osteoporosis’ or ‘established osteoporosis’ refers to ‘a value for BMD 2.5 SD or more below the young female adult mean in the presence of 1 or more fragility fractures’ (Kanis 2007).

‘Moving and handling’ refers to the 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 moving and handling aids; it also refers to the moving and handling risk assessments carried out by healthcare staff (Hignett 2003, Hignett et al 2014, Smith 2005).

‘Manual Handling’³ is the term used in legislation, NHS policy documents, the work place, National and Local clinical guidelines. It refers to the particular organisational provision that local work places, including Health and Social Care services, are required to provide to comply with National and European legislation.

³ For the purposes of this research the term ‘moving and handling’ (M&H) is used hereafter. (See definitions of terms, p. 14)

Phase 1: Research

Study 1: Qualitative Interviews with Healthcare Professionals

The views and experiences of healthcare staff on the moving and handling of adults [age 60+] with osteoporosis, while in hospital, were investigated. In particular, the research explored whether the moving and handling³ risk assessments and interventions for older adults with osteoporosis differed from standard moving and handling practice.

26 healthcare professionals from nursing, physiotherapy, radiography (including specialists in DEXA scanning), occupational therapy, and manual handling advisers from across these disciplines participated in qualitative interviews. Participants were linked to a variety of acute settings within one Scottish Health Board.

The main themes to emerge from the qualitative data analysis of the healthcare professionals' data were as follows:

- Healthcare practitioners' capacities and capabilities for caring for people with osteoporosis
- Understanding moving and handling as routine care or as a healthcare intervention
- Person-centred approaches to moving and handling
- The structural and organizational context for moving and handling
- Education to promote person-centred care

MAIN FINDINGS:

- *Healthcare practitioners' capacities and capabilities for caring for people with osteoporosis*

Frontline healthcare staff require improved awareness of the prevalence of osteoporosis and the associated increased fracture risk. Accidental injuries (low-trauma fractures) in older people with osteoporosis tend to be linked to falls (around 7% of hip fractures occur in hospital, Foss et al 2005), vertebral fractures however have a different mode of presentation. We found only isolated and infrequent examples of accidental injury apparently resulting from moving and handling procedures in people with osteoporosis.

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

Healthcare staff referred to exemplars of safe and effective moving and handling that demonstrated sound professional values including respect for the person with a few isolated examples of potentially sub-optimal practice reported by staff and patients. Key dimensions of a person-centred focus in the context of moving and handling in older people with osteoporosis as reported by participants are illustrated in diagram 1 (see below). There was a tendency to use the terms 'osteoporosis' and 'frailty' interchangeably suggesting misconceptions about osteoporosis, a disease that can be present with no outward manifestations. Osteoporosis is a complex disease and the fragility of bones occurring in severe disease means fractures can result from minimal pressure or happen spontaneously.

All staff participants recognised the importance of upholding ethical and professional standards of care at all times.

Diagram 1: Person-centred factors reported by participants in relation to moving and handling practice in older people with osteoporosis (and/or frailty).

PATIENT ASSESSMENT & RISK ASSESSMENT

- Patient factors
- Vulnerability & frailty
- Changing clinical states
- Pain assessment & management

INTERVENTIONS

- Focusing on the person requiring care (the values and attitudes guiding individual's practice)
- Application of communication skills
- Providing safe and effective care

CORE PRINCIPLES IN PEOPLE WITH OSTEOPOROSIS AND/OR IN FRAIL OLDER PEOPLE

- Preparation, explanation, individual preferences
- Promoting mobility / independence / activity
- Pain control
- Awareness of 'fear of falling'
- Positioning and comfort
- Minimal handling
- Spreading load / open hand-holds
- Taking time
- Correct application of specific procedures

There appeared to be limited weight attached to the significance of osteoporosis as a 'patient factor' that could influence the moving and handling needs of older adults although there were expectations that registered healthcare professionals were expected to apply their medical knowledge.

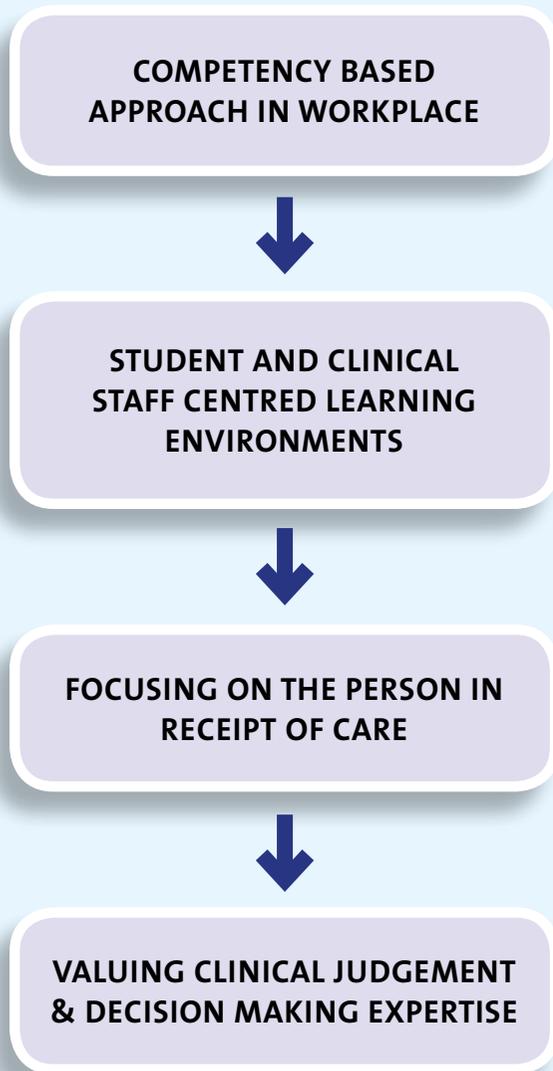
The structural and organizational context for moving and handling

It was noted that NHS Manual Handling guidelines and staff education systems promote principles of safe and effective practice for all staff. They are generic rather than focused on specific medical conditions. Accidental injury linked to moving and handling was not noted to be a major or recurring problem, although media reports of incidents elsewhere in the UK were cited. Cases of spontaneous or pathological fracture were recalled by a few participants, and some reported that falls in hospital could result in hip fractures. The importance of a positive organisational culture and effective management to ensure that workload and staff skill-mix issues were addressed was raised by healthcare staff and some patients.

Education for person-centred care in safe and effective moving and handling

Staff participants acknowledged the importance of education in the promotion of safe and effective moving and handling practice. A system of work-based competence assessment in the clinical areas rather than in a classroom setting had recently been introduced in the NHS research site. Manual Handling Advisors reported that this change offered greater opportunities for working with clinical staff to address the reality of moving and handling in everyday practice. Respect for the person as a guiding principle in moving and handling practice came across more strongly in some accounts than others. Evidence of expertise relating to moving and handling in the context of people with long-term conditions such as osteoporosis was revealed to varying degrees. This seemed to be largely tacit or taken for granted knowledge made accessible through deeper critical reflection on particular cases and occurred alongside a concern for the person in their care. The sub-themes identified in the data are shown in diagram 2 (see page 17) and are developed within later phases of the project.

Diagram 2: Key factors related to the provision of education to promote safe and effective moving and handling that is focused on the person.



There was some resonance between the themes identified in the healthcare staff data above (study 1) and in the patient data (study 2) as reported in the next section.

KEY OUTPUTS:

2014 MA Coulter Smith, F O'May, S Tropea, R Rush, J Berg, L Irvine, R Wilson, C Pearson

The Moving and Handling needs of Older Adults with Osteoporosis in Acute Care.

Conference abstract. Osteoporosis Conference, Birmingham 29th November to 2nd December 2014. *Osteoporos Int* (2014) 25 (Suppl 6):S659–S726 DOI 10.1007/s00198-014-2893-0

2016 Coulter Smith M A, O' May F, Tropea S, Berg J.

Framing Moving and Handling as a Complex Intervention in the Acute Care of Older Adults with Osteoporosis: A Qualitative Study.

Journal of Clinical Nursing.
Accepted for publication 19th April 2016.
Wiley Open Access (unique ID: 5511802-1606658)





Study 2: Qualitative Interviews with Older Adults with Confirmed Diagnosis of Osteoporosis

This study explored the views and experiences of older adults [age 60+] living with osteoporosis about their perceived healthcare needs, including moving and handling, within a Health Board in Scotland. The data were collected in a similar time period to the healthcare staff data, and during 2012-2013.

The final sample comprised 16 participants, the majority of whom were female, and all were living at home at the time of data collection. The age range of patient participants spanned from 63+ up to 85 years.

The broad themes identified in the data included the following:

The diagnostic journey;

Living with osteoporosis;

Addressing the information and education needs of healthcare staff, patients and their families;

Care experiences; and

Maximising the health and well-being of people with osteoporosis.

MAIN FINDINGS:

The diagnostic journey

People's routes to confirmed diagnosis of osteoporosis ranged from chance conversations with informed lay people or family members who were health professionals, through to timely and effective screening, identification and referral into the Osteoporosis and FLS. There was general satisfaction with the care received from the Osteoporosis Service once referral had taken place. The difficulty for patients was often that the journey to the service had been curtailed by a lack of awareness of the condition by healthcare professionals with whom they had contact often over a period of years.

Living with Osteoporosis

Living with osteoporosis was influenced by a range of factors not least the severity and site of osteoporosis, which in turn had varying impacts on participants' day to day activities.

Addressing the information and education needs of healthcare staff, patients and their families

Patients referred to a need for specifically targeted education to raise staff's awareness

of optimal moving and handling for people with osteoporosis in hospital. They believed this could minimise the risk of low trauma fractures potentially linked to inappropriate moving and handling, as highlighted by a participant who sustained fractures during a routine mammogram procedure.

The importance of maintaining physical functioning and mobility was unanimously highlighted. Whilst remaining mobile and taking regular exercise were stressed, there was confusion around advice received about how much and the type of exercise they should, and as importantly, what they should not, be doing.

Patients expressed increased awareness of the risk of falls since diagnosis of osteoporosis. There would appear to be an opportunity here for both relevant healthcare staff and patients to be better advised about appropriate exercise, tailored to the individual, their severity of osteoporosis, particular symptomatology and degree of frailty. Broad exercise recommendations are available (see www.iofbonehealth.org and www.nos.org.uk websites), but participants in the study sample tended not to refer to published guidance or indeed know where to access it.

Care Experiences

Participants were asked about their experiences of care during their admission to hospital, with reference to moving and handling, and for examples of when they were treated well, and also where they felt things could have been done differently, and/or better.

There were many reports of high quality care being received but a few participants also reported examples of poor communication skills or limited awareness of osteoporosis in some acute settings. One participant with vertebral osteoporosis had a good understanding of the risks associated with leaning forward, yet she thought the staff appeared oblivious as items were not placed within easy reach.

Contrasting experiences of different ward cultures and the impact of culture on quality of care were issues raised by one highly observant participant who was also a nurse. For example, in two adjacent wards there could be an 'atmosphere of calm' in one and 'an atmosphere of we don't have a second to pay attention to anything' next door.

Feedback from the majority of participants indicated that staff seldom referred to their osteoporosis, or enquired about specific care needs linked to the condition. Participants

themselves tended not to alert staff to their osteoporosis diagnosis, even when undergoing procedures requiring positioning that was uncomfortable (e.g. colonoscopy, mammography), but would say instead, for example, 'they found it difficult with their back'. One participant said that they 'wouldn't want to make a fuss', but thought that staff might need to know of the condition for certain activities, such as getting into or out of bed in hospital. Another person said that during her brief admission to A&E, neither she nor the staff had mentioned her osteoporosis, as she felt there was not a need. Some expected that hospital staff would have access to their patient notes, and so would see and/or know of the diagnosis, or see their attendance for DEXA scan, or note their prescribed medication for the disease, and that therefore they would not need to draw it to their attention.

Maximising the health and well-being of people with osteoporosis

Osteoporosis is a disease that in many cases remains 'silent' until an adverse event such as a low trauma fracture occurs. Upon diagnosis some were obviously in shock because they did not exhibit any of the physical signs traditionally associated with osteoporosis, particularly curvature of the spine. The diagnosis of osteoporosis often came following investigation of musculoskeletal problems.

There was for some a sense of regret regarding missed opportunities to diagnose osteoporosis earlier, although they did not indicate what, if anything, they might have done differently had they known. Osteoporosis resulted in a large psychological burden for some patients, from a recently diagnosed person with severe osteoporosis in whom diagnosis 'came as a huge shock' through to a person with a long history of osteoporosis who was experiencing increasing levels of social isolation and being housebound due to a fear of falling when outside the home 'I just can't go out [walking] on my own now, I'm just too frightened to go out on my own unless there is somebody with me'. Yet, for another, knowledge of their condition was not unwelcome, as it made sense of several previously unexplained breaks, 'it all fell into place' once she received the diagnosis.



A number of participants had clearly been suffering symptoms such as severe back pain for many years, attending their GP throughout, but the differential diagnosis of osteoporosis was apparently not considered. For these participants the confirmed diagnosis came as a shock as they now had an explanation for health problems that had taken a considerable toll on their health and well being, and overall quality of life, and some had even been forced to make decisions to retire early due to severe and unpredictable bouts of back pain. One participant spoke of missed opportunities to diagnose postmenopausal osteoporosis and how her referral to the Osteoporosis Service was made by a new GP some years after the onset of symptoms.

KEY OUTPUTS:

2015 Smith M.

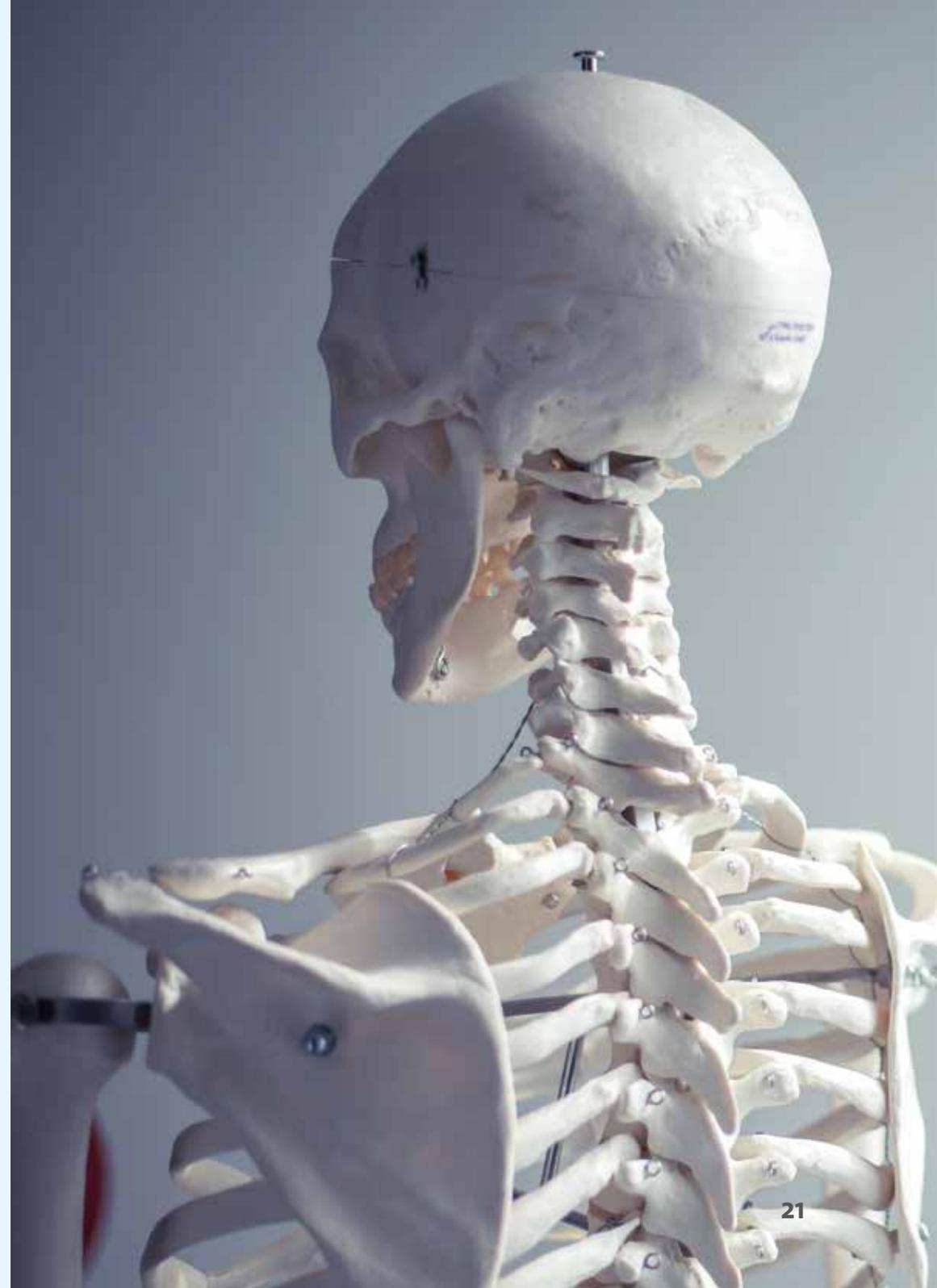
Investigating the experiences of older adults with osteoporosis focusing on the diagnostic journey and pathways to specialist care.

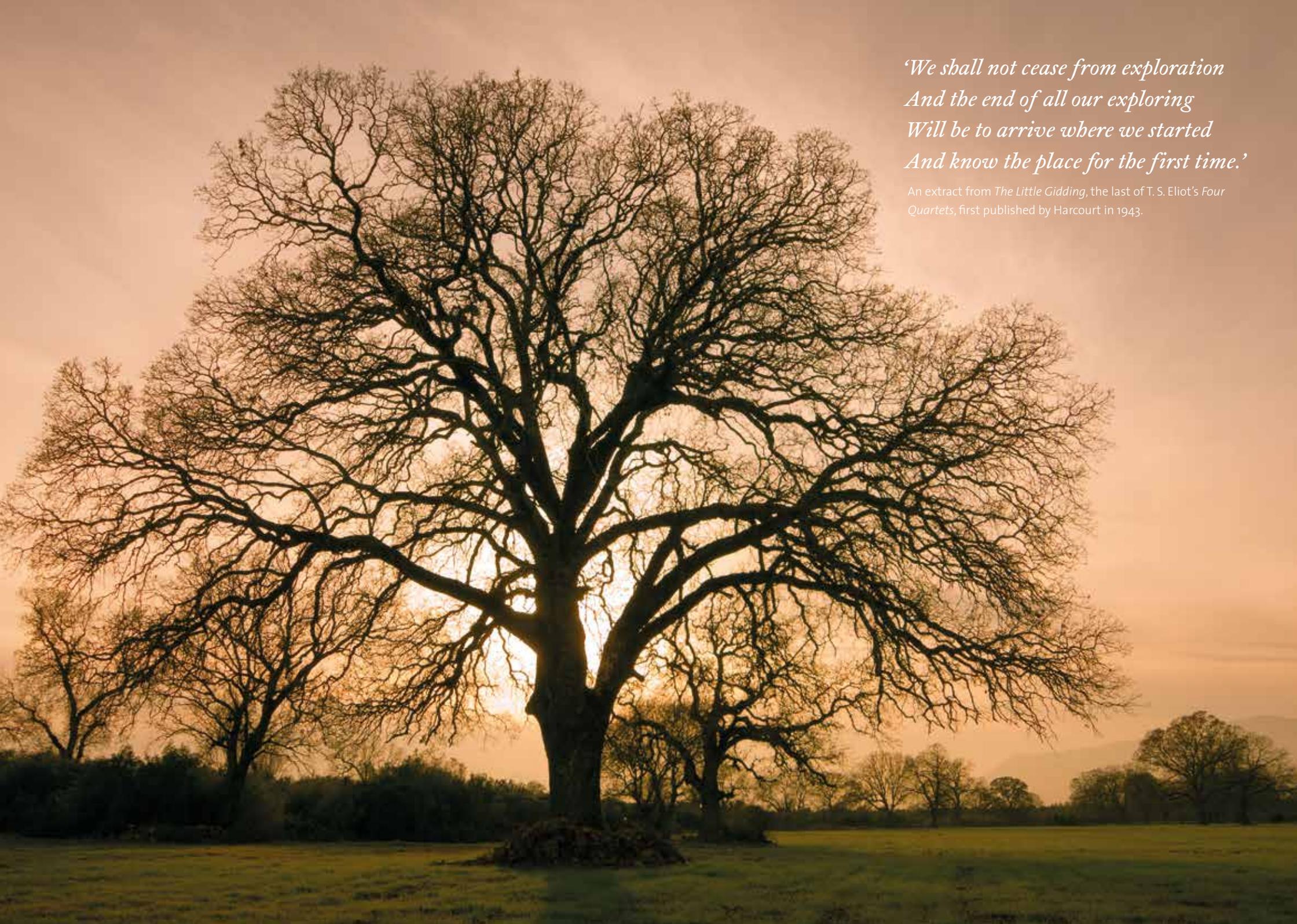
Presentation: speaker, Margaret Smith.

From The European Academy of Nursing Science
EANS Summer Conference, Barcelona, Spain. 8-9
July 2015 *BMC Nursing* 2015, 14(Suppl 1): S8
www.biomedcentral.com/1472-6955/14/S1/S8

Poster presentations (see Phase 4)

***Paper for peer-reviewed publication
under preparation***





*'We shall not cease from exploration
And the end of all our exploring
Will be to arrive where we started
And know the place for the first time.'*

An extract from *The Little Gidding*, the last of T. S. Eliot's *Four Quartets*, first published by Harcourt in 1943.

Study 3: Systematic Search and Narrative Review of the Literature

At the outset a systematic search and narrative review of the literature on osteoporosis, nurses knowledge of osteoporosis, and moving and handling, was undertaken to inform phases one and two of the project. As the project progressed further literature was reviewed, including the incidence and prevalence of in-hospital fracture and frailty. There is now an expanding literature on promoting mobility in older people in acute, rehabilitation and nursing home populations (Kneafsey and Haigh 2009, Kneafsey et al 2013, Taylor et al 2016). The current project adds to this evidence base by illustrating the importance of viewing moving and handling as a complex healthcare intervention in the context of older people with osteoporosis in acute care (Coulter Smith et al 2016).

KEY OUTPUTS:

Literature review sections included in all research ethics submission documents to date (phases 1, 2 and 4).

Literature review section included in peer reviewed publications to date.

A scoping review of the literature on osteoporosis, incidence of in-hospital fracture, nurses' knowledge of osteoporosis and moving and handling is currently being completed and a paper is under preparation for a peer-reviewed publication.

The findings from phase one informed the rationale for the design and content of the education intervention and evaluation undertaken within the feasibility study for phase 2 of the project.

Right: Literature review focused on primary research, systematic reviews and clinical guidelines (including SIGN 2015, as shown here).





Phase 2: Education Intervention Feasibility Study

Study 4: The Education Workshop Intervention and Pre/Post-Test Evaluation Feasibility Study

The need to improve healthcare staff's awareness of the impact of osteoporosis on individuals' daily lives, to increase knowledge about the prevalence of the condition in older people and to enable exploration of patients' potential care needs emerged as key areas for further work arising from phase one of the project. Improved knowledge levels alone do not necessarily guarantee changes in healthcare staff's behaviours and so the project team elected to use education approaches that encourage deeper rather than surface approaches to learning (Biggs and Tang 2011) and to work within a learner-centred approach.

AIM:

The main aim of this phase was to implement and evaluate an education workshop intervention to enhance nursing staff's awareness and understanding of the needs of older people with osteoporosis while in hospital, thus influencing their ability to offer safe effective person-centred care.

OBJECTIVES:

- To assist in the identification and risk assessment of older people with osteoporosis (diagnosed or undiagnosed) by application of experiential learning methods;
- To increase awareness about the effects of osteoporosis on Activities of Daily Living (ADLs) and thus the care needs of older people with osteoporosis (diagnosed or undiagnosed) while in acute hospital;

- To increase awareness about safe person-centred moving and handling for all people, including special groups that are at increased risk of fractures.

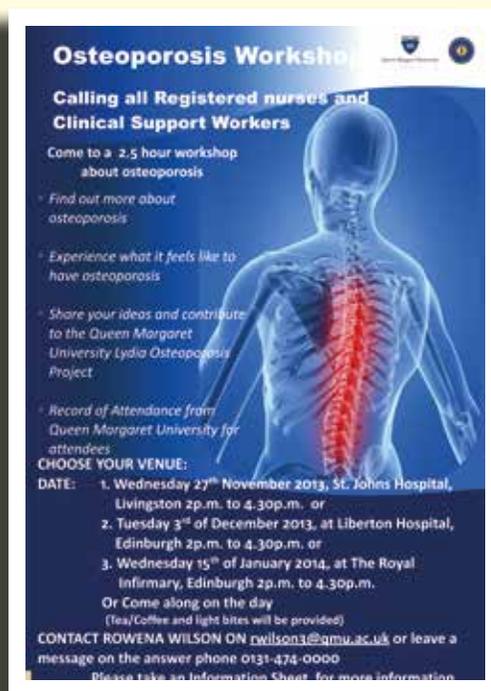
Experiential, simulation and transformational learning theories focus on the transformation of experiences into knowledge which facilitate changes in the way people think and behave (Mezirow 2009, Mortiboys 2012). Situating learning within the relevant contexts and using learner-centred environments allows for the engagement in authentic activities and promotes conceptual change (Jonassen and Land 2012). By using broad-based simulation and experiential learning approaches, the participants would be exposed to and challenged by the experiences of suffering from osteoporosis thus assisting in reflexivity and application of internalised learning to their practice (Moon 2004). Fortunately, a member of the project team (ST) had attended an International conference (The Bi-annual National Osteoporosis Society and Bone Health Conference held in Manchester in 2012) and observed osteoporosis clinical simulation suits being used. The educational potential was quickly recognised and the project team negotiated access to two simulation suits with the supplier, a commercial drug company.

An education feasibility study comprised a pre/post-test quantitative observational research design with an experiential workshop and clinical simulation as the education intervention. Following NHS Clinical Governance Approval, workshops were offered in a local Health Board area and 51



participants (n=51) volunteered to participate. The convenience sample comprised qualified and unqualified healthcare professionals. Participants completed baseline and post intervention questionnaires. The education workshop (and the clinical simulation exercises in particular), was positively evaluated by participants. The full results have been analysed and tabulated and will be submitted for publication in the near future. Preliminary results were presented to the All Scotland Osteoporosis Nurse Specialist and Fracture Liaison Network hosted by NOS in 2014 and reported in an oral presentation at the final Stakeholder Conference in 2015.

The findings from the experiential education intervention and evaluation feasibility study informed the development of the complex (education) intervention that was developed in phase 3.



KEY OUTPUTS:

Oral presentation at the NIHR Older People Conference, Queen Margaret Hospital, Dunfermline,

Irvine L, March 2014

Poster presentation. The moving and handling needs of older adults with a confirmed diagnosis of osteoporosis in acute care

At the NIHR Older People Conference, Queen Margaret Hospital, Dunfermline, Smith MAC et al., March 2014

Stakeholder conference oral presentation, preliminary findings

Phase 2. Irvine L, 6th November 2015

Plan to submit paper for peer-reviewed publication

Irvine L and project team, summer 2016.



Phase 3: Development of a Complex (Education) Intervention

A complex education intervention '*Caring for my bones*' was designed to promote complex learning about the implications of osteoporosis for acute care.

The purpose was to engage frontline healthcare staff in complex learning to raise awareness of osteoporosis, fracture risk and to promote values-based safe and effective moving and handling for older people. The *Caring for my bones* education intervention draws on the 'Ten steps to complex learning and four components of systematic approach to instructional design (Van Merriënboer & Kirschner 2013) comprising the learning task, supporting information, procedural information, and part-task practice. An overview of the contents of the education intervention is shown in diagram 3 on page 29.

A range of education and learning materials including moving and handling videos with accompanying learning tasks was developed. The video footage was made in collaboration with members of the QMU Manual Handling Team and in consultation with the NHS Lothian Manual Handling Service.

In order to reach a wider audience than would be possible through the face to face workshops mode of delivery, reported in phase 2, the project team decided to translate the 'Caring for my bones' complex learning intervention developed here in phase 3 into an online module that could be hosted on the University Hub@qmu online learning network. Within phase 4, to achieve the wider dissemination of project findings, the project team worked with an external IT company to develop an interactive website and this resource was used to showcase extracts of the online complex learning module as detailed in the next section.



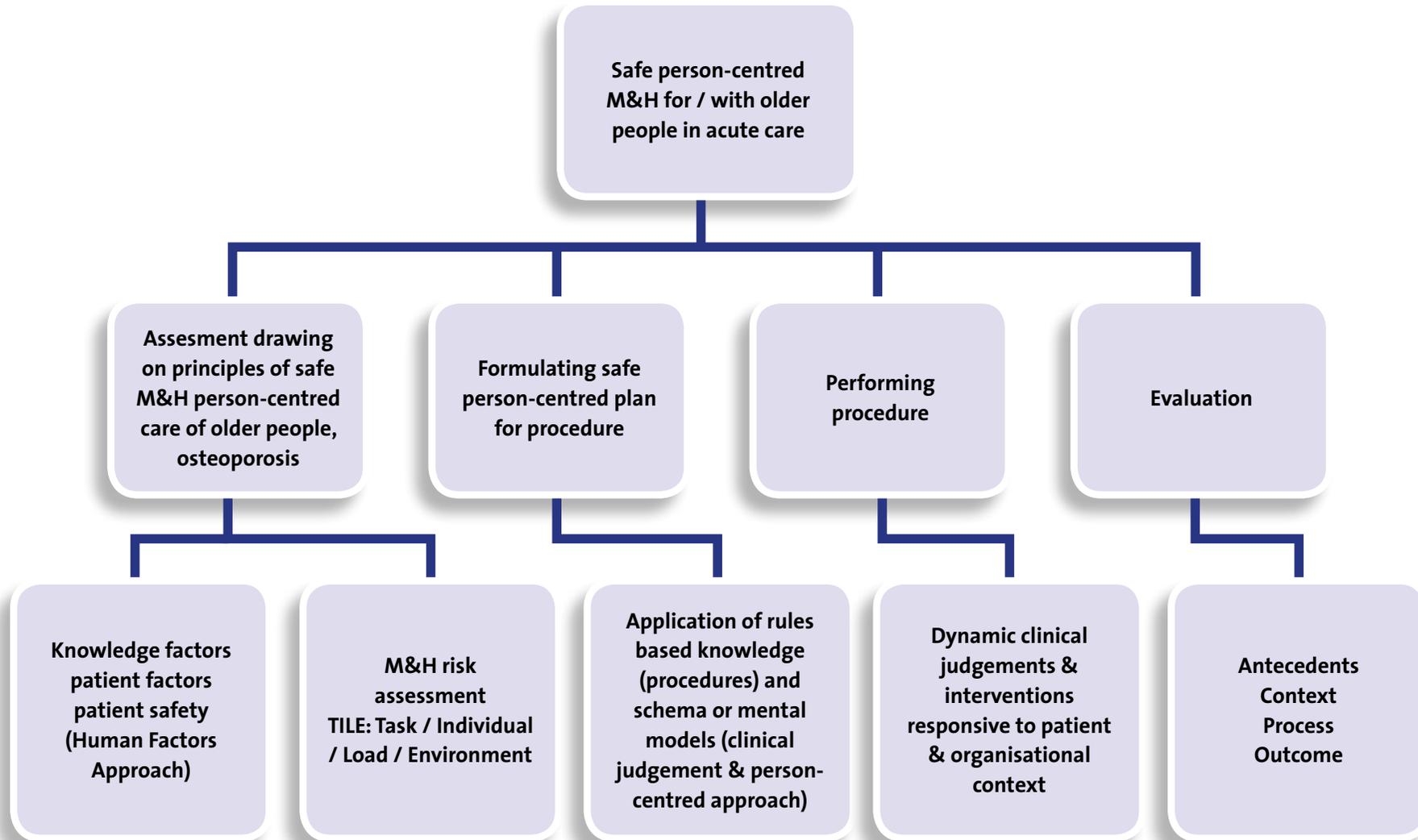
Caring for my bones online learning module, Hub @ QMU

KEY OUTPUTS:

Smith MAC 2014 What are the safety implications of moving and handling interventions for older people with osteoporosis in acute care and how can these be addressed using a complex education intervention (CI)? Oral presentation. European Academy of Nursing Science Summer Conference, 8th July 2014, University of Rennes, France.

Diagram 3: Hierarchy of skills (Smith MAC 2014)

HIERARCHY OF SKILLS WITH LINKS TO RELEVANT KNOWLEDGE & ATTITUDES





Phase 4: Project Dissemination & Evaluation

The goal was to raise awareness of osteoporosis and the moving and handling needs of older people with this condition across a wide range of audiences including healthcare professionals, academics, students, patients, family members and members of the public. The project team used all opportunities that presented during the life-time of the project at local, national and international levels. We have used different types of media from writing for academic publications, to popular media and publications aimed at people with osteoporosis. We have been active in online and Social Media. Members of the project team currently participate in a range of networks including the National Osteoporosis Society, Scottish Intercollegiate Guidelines Network, European Academy of Nursing Science, Higher Education networks, the Royal College of Nursing, NHS and Manual Handling communities and we have contributed to interviews with journalists for national radio, television, and national newspapers. The project has been promoted in local university publications. Members of the team interact daily with a wide range of students, academics, researchers, clinical and education experts, and there have been unique opportunities to present the project findings to key political figures and policy makers during visits to the university. A summary of these various activities is presented here.

KEY OUTPUTS:

Journal publications to date:

2016 Coulter Smith M A, O' May F, Tropea S, Berg J.

Framing moving and handling as a complex intervention in the acute care of older adults with osteoporosis: A qualitative study.

Journal of Clinical Nursing. Accepted for publication 19th April 2016

2015 Smith M.

Investigating the experiences of older adults with osteoporosis focusing on the diagnostic journey and pathways to specialist care.

Speaker Presentation Margaret Smith. From The European Academy of Nursing Science EANS Summer Conference, Barcelona, Spain. 8-9 July

2015 BMC Nursing 2015, 14(Suppl 1): S8

www.biomedcentral.com/1472-6955/14/S1/S8

2014 MA Coulter Smith, F O'May, S Tropea, R Rush, J Berg, L Irvine, R Wilson, C Pearson

The moving and handling needs of older adults with osteoporosis in acute care.

Conference abstract. Osteoporosis Conference, Birmingham 29th November to 2nd December 2014. Osteoporos Int (2014) 25 (Suppl 6):S659–S726 DOI 10.1007/s00198-014-2893-0

2011 Smith MAC and Revie E.

The Lydia Osteoporosis Project

Short article published in Osteoporosis News Autumn edition

Internal QMU publications:

QMNEWS 2012 Issue 74, QMYOU 2015 Issue 81.

Local, national and international conference presentations to date:

- 2015 Smith MAC* Pearson C, Irvine L*, Tropea S, Wilson R. Lydia Osteoporosis Project Stakeholder Conference. Oral presentation, plenary, presentations. QMU, 6th November.
- 2015 Smith MAC* and Pearson C*. ENTER2015 Conference. 13th August, Title: Osteoporosis Clinical Simulation Workshop. Event hosted by QMU.
- 2015 Smith MAC* Researching Complex Interventions in Health: The State of the Art, Exeter, UK, 14-15 October. Poster Presentation Title: Launching a web-based complex education intervention, 'Caring for my bones', Lydia Osteoporosis Project. Masterclass hosted by the European Academy of Nursing Science and Interdisciplinary Conference, University of Exeter, UK.
- 2015 Smith MAC Missed Opportunities in the Diagnostic Journey of Older Adults with Osteoporosis: An exploratory qualitative study. Oral presentation. EANS Summer Conference Barcelona, Spain. 8th and 9th July.
- 2015 Pearson C*, Smith MAC Lydia Osteoporosis Project Update to NOS Scotland National Patient Support Group. Glasgow 16th March.
- 2014 Coulter Smith M A* F O'May, Dr S Tropea, R Rush, J Berg, Dr L Irvine, R Wilson, C Pearson. The moving and handling needs of older people with osteoporosis in acute care Osteoporosis Conference 2014 Birmingham ICC. 30 November, 1st and 2nd December.

- 2014 Coulter Smith M A* F O'May, Dr S Tropea, R Rush, J Berg, Dr L Irvine, R Wilson, C Pearson. The Moving and Handling Needs of Older Adults with Osteoporosis. Poster presentation for NIHR Age and Ageing Speciality Meeting, Dunfermline, Fife, 7th March.
- 2014 Irvine L* Lydia Osteoporosis Project, Phase 2 Education Workshops and Evaluation Preliminary Findings, short oral presentation at NIHR event, Dunfermline, Fife. 7th March.
- 2014 Pearson C*, Smith MAC Lydia Osteoporosis Project Update to NOS 21st October, Scotland National Network of Osteoporosis and Fracture Liaison Specialist Nurses.
- 2014 Coulter Smith M A* How can the evidence base for nursing be improved in order to ensure that the essentials of care become reality rather than rhetoric? What are the safety implications of moving and handling interventions for older people with osteoporosis in acute care and how can these be addressed using a complex education intervention (CI)? European Academy of Nursing Science. Summer Conference. 8th and 9th July 2014. University of Rennes, France.
- 2013 Smith MAC*, L Irvine, S Tropea, F O'May, S Cameron, J Berg Concurrent Paper, Oral Presentation at the RCN Annual International Nursing Research Conference, Belfast, 20th to 22nd March. The moving and handling needs of older adults with osteoporosis while in hospital: preliminary findings.
- 2012 Tropea S*, Smith MAC Lydia Osteoporosis Project Team Update to NOS Patients' Support Group. November.

- 2011 Smith MAC* Introduction to the Lydia Osteoporosis Project to NOS Scotland-wide group of Osteoporosis and Fracture Liaison Services Nurse Specialists, Edinburgh.
- 2011 Tropea S*, Smith MAC Introduction to the Lydia Osteoporosis Project to NOS Patients' Support Group, Glasgow.

Participation in other events

- 2016 Smith MAC*, Pearson C, Irvine L. Presentation of the Lydia Osteoporosis Project to the First Minister for Scotland, the Rt. Hon. Miss N Sturgeon MEP. On the occasion of the Scottish Government Visit to QMU for the announcement of a health manifesto, 10th February.
- 2015 World Osteoporosis Day Events included BBC Radio Scotland Interview with Ken McDonald, 20th October, participation in STV news interview and clinical simulation suits video, various items on Social Media leading up to World Osteoporosis Day, interview for Scotland on Sunday article 20th October 2015.
- 2014 Smith MAC* Invitation to Lead a Research Seminar Day for Academic Staff, (one of two lectures presented focused on the Lydia Osteoporosis Project). At the Division of Nursing, King Saud University, Riyadh, Kingdom of Saudi Arabia. March 2014.

Selected education seminars and/or workshops:

- 2016 Smith MAC The Scottish Manual Handling Advisers Annual Conference in Glasgow, 25th May 2016. Consecutive workshops on the application of clinical simulation in the Lydia Osteoporosis Project, co-presenters Pearson C, McClintick C, Wallace L.
- 2015 Queen Margaret University, Lecture and workshop for year 1 BSc Hons Nursing students. November.
- 2014 University of Edinburgh, Lecture and workshop for year 2 BSc Hons Nursing Science students. February.
- 2012 Smith MAC and Tropea S. Moving and handling older patients with osteoporosis in hospital: Researching a sensitive topic. May. NHS Lothian and 3 HEIs Joint Healthcare Research Seminar, QMU.



Further planned dissemination activities:

2016 Coulter Smith M., Pearson C. Abstract submitted to NOS International Osteoporosis Conference, Birmingham, UK, 7th to 9th November Title: the dissemination phase of the Lydia Osteoporosis Project.

Smith MAC Seminar presentation: Findings arising from the Lydia Osteoporosis Project (LOP 1 & 2) NHS Lothian and 3 HEIs Healthcare Research Seminar Series. 4th December 2016. Venue TBC.

Development of an Interactive Website

An outline proposal for an interactive website was developed to assist in the wider dissemination of project findings. Content and education materials including education video clips were prepared for inclusion in the website and an external IT company was commissioned to design and deliver an interactive website with niche social network features. The latter was undertaken in collaboration with frontline staff, patients, members of the public, NHS specialists, academics and learning technologists. A summary of this resource is provided in a poster accepted for presentation at a Complex Healthcare Interventions Interdisciplinary Research Conference in Exeter in September 2015.

PROJECT EVALUATION

Several approaches have been taken to the final project evaluation. In phase 4 a Stakeholder Meeting comprising four specialist clinicians, members of the project team and IT consultants met to explore the potential for developing a new interactive project website⁴. Subsequently a second Stakeholder Workshop/ Group was held comprising specialist clinicians from

⁴ Prior to conducting the online evaluation surveys the plans for phase 4 were submitted for QMU Research Ethics Approval and this was confirmed on 10th January 2016.

Launching the Lydia Osteoporosis Project website including the complex education intervention, 'Caring for my bones'.

Margaret A Coulter Smith
PhD, MSc, RN, Member of EANS.
Queen Margaret University, Edinburgh, Scotland.

Background
The Project Team is working with IT consultants to develop the Lydia Osteoporosis Project website.
• Purpose: to assist in the dissemination phase of the Lydia Osteoporosis Project.
• Collaboration includes NHS colleagues, members of the National Osteoporosis Society, academics and patients.
• It comprises:
– A fully responsive interactive website
– A niche social network
– Offers further opportunities for highly interactive learning modules in health and social care settings.
The first phase of the website is due to 'go live' in November 2015.

Overall Design of Lydia Osteoporosis Project:

- Phase 1: Exploratory qualitative research with healthcare professionals and people with confirmed osteoporosis diagnosis
- Phase 2: Education feasibility study to evaluate an experiential workshop & clinical simulation intervention to raise awareness of osteoporosis and the patient experience
- Phase 3: Development of a complex education intervention, 'Caring for my bones' focusing on osteoporosis, fracture risk and values-based safe and effective moving and handling for older people
- Phase 4: Dissemination of project findings, provide education opportunities, engage in conversations with frontline staff and wider osteoporosis community.

Aims of Dissemination Phase

- To increase awareness of osteoporosis, fracture risk and implications for nursing care by disseminating key findings from the Lydia Osteoporosis Project
- To facilitate conversations between frontline staff and others about the nursing implications of osteoporosis for older people
- To provide a platform for innovative education resources, 'Caring for my bones' and ultimately,
- To enhance the patient experience of nursing care.

Content of Dissemination Phase
Uses a range of traditional through to contemporary methods and innovative cloud-based technology:

- Presentations, peer-reviewed publications, the media
- A bespoke interactive website using Social Engine®, a web-based social network platform with content management features and options for site analytics
- Laying foundation for a Niche Social Network for engagement with frontline healthcare staff and hosting conversations with all members of osteoporosis community
- Web-based education geared towards complex learning with potential for expansion for a range of learners across Health and Social Care.

Where we are now

Completed:

- Review of osteoporosis & moving and handling literature.
- Exploratory qualitative research studies with healthcare professionals & people with osteoporosis.
- Education feasibility study with NHS staff.
- Further complex education intervention development work.

Project dissemination phase underway:

- A stakeholder conference and launch of Lydia Osteoporosis Project website/ niche social network, to 'go live' in November 2015.

Also in progress:

- Writing for publication.
- Preparations for a second Lydia Osteoporosis Action Research and Evaluation Project to commence Autumn 2015.

Smith MAC (2015), Poster presentation at Researching Complex Interventions in Health; The State of the Art, Exeter UK

Manual Handling, Osteoporosis and Falls Prevention services, Healthcare Improvement Scotland, academics, researchers and members of the public (including people with confirmed diagnosis of osteoporosis) at the University (16 people were in attendance for all or most of the workshop). The purpose was to discuss more detailed plans for the new interactive website. Following the Stakeholder Workshop evaluation comments about the proposed development were very positive.

The main project findings were reported during a Stakeholder Conference at the University on the 6th November 2015. This event coincided with the preview launch of the new www.lydiaosteoporosis.com website. Invitations were sent to 95 guests including members of the public, a range of health care professionals, academics, clinical managers, students, and IT specialists., 40 confirmed attendance, around 25 sent their apologies due to other commitments, and a further 20 (mainly QMU staff) attended for parts of the conference.

Feedback received on the day and in response to an online survey was very positive. All stated they had found the presentations to be of a high quality and they had particularly enjoyed the launch of the new www.lydiaosteoporosis.com website. Various displays including the interactions with undergraduate nursing students wearing osteoporosis clinical simulation suits were also received with enthusiasm and interest.

Selected Quotes from Stakeholder Conference Participants:

“I was so glad I had been invited and able to learn of the wonderful progress made [in the project]. The website is also excellent. Congratulations to you all.”
(member of the public)

“A very enjoyable afternoon and exciting development for future care of osteoporosis patients.” (healthcare professional)



Stakeholder Conference, 6th November 2015.

Extracts from the www.lydiaosteoporosis.com website

ABOUT OSTEOPOROSIS

What is osteoporosis?

Osteoporosis is a disease that attacks bones with the spine being the most frequently affected, followed by the hip, wrist, and other sites. It alters bone structure, bones become more 'porous', bone mass is reduced, bones become more fragile and people affected are at increased risk of low-trauma fracture (NOS 2013, SIGN 2015). Low-trauma fracture refers to fractures involving minimal force such as a fall from a standing height or less.

How big a problem is it?

Osteoporosis is a common bone disease that affects over 3 million people in the UK (including 250,000 in Scotland) and accounts for around 300,000 fractures per year (Age UK 2015, ICF 2015, NOS 2015). Osteoporosis rates increase with age and in the context of a rapidly ageing population in the UK and elsewhere, the overall numbers will continue to rise. Indeed medical specialists refer to an impending 'osteoporosis epidemic' as around 50% of people aged 75 and over have osteoporosis. Globally osteoporosis is a large public health issue. Although it is commonly viewed as a disease mainly affecting postmenopausal females, it can strike many others in the population. For example, recent robust evidence shows it affects older males in significant numbers giving rise to an increased risk of hip fracture and often poor health outcomes especially in males over 75 years. As this disease is often 'silent' in its presentation until fractures occur, it is frequently under-diagnosed in the general population and as a result people may not gain access to treatment until it is well-advanced.

So how does osteoporosis impact on people's health?

Osteoporosis is associated with higher rates of poor health and increased risk of death (DOF 2015). A serious consequence of osteoporosis is the increased risk of low-trauma fracture with hip fractures linked to osteoporosis incurring most of the negative health outcomes and financial costs. Hip fractures disproportionately affect older

LATEST ARTICLES

- Video: Handling Techniques
- Healthy Eating Tips!
- Lydia Project Website Launched!
- Video: Osteoporosis Jump
- Healthy Eating Tips!

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QMU LEADS RESEARCH

POPULAR

- Healthy Eating Tips!
- Lydia Project Website Launched!
- Video: Osteoporosis Jump

NEW

- Video: Handling Techniques
- Healthy Eating Tips!

Welcome to the Lydia Osteoporosis Project

A research, education implementation and dissemination project with frontline healthcare staff and people with osteoporosis.

The overall aims of the Lydia Osteoporosis Project are to raise awareness of osteoporosis and the increased risk of fracture amongst frontline healthcare staff caring for people with the condition.

UPCOMING EVENTS

05/11/2016	NOS Osteoporosis Conference 2016 International Conference Centre, Birmingham 12:00 - 18:00	Details
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Following the Stakeholder Conference the Project Team worked closely with the IT Company to address 'final fixes' and ensure that visitors to the website were able to smoothly navigate the pages and successfully sign up to join the Osteoporosis Community. The fixes were completed by January 2016. An online survey was sent to members of the website community and other contacts to collect data on people's views and experiences of using the resource on 25th January 2016. One reminder was emailed to potential respondents and the survey was closed on 23rd February 2016. Of the 26 respondents, the majority were healthcare professionals, some were academics and the remainder were members of the public. The majority reported that the website met their needs very well. All reported that they found it very easy to navigate the site, the majority found it very relevant and all stated that it was very attractive. Most had not fully appreciated the interactive social networking potential of the website so this feature will be highlighted going forward into further projects.

Social Media & Popular Press



STV filming at World Osteoporosis Day Event, 20th October 2015

Summary of Main Findings and Outputs of the Lydia Osteoporosis Project:

- Experienced healthcare staff reported knowledge of osteoporosis and the associated increased fracture risk but tended to underestimate its prevalence in the older population. Whilst some readily referred to implications for practice, particularly around promoting safety and comfort including during moving and handling, others made little distinction between normal moving and handling care and moving and handling in the presence of osteoporosis.
- The data provide examples of clinical expertise where tacit knowledge about moving and handling for people with either diagnosed or suspected osteoporosis was brought to the fore. The complex nature of moving and handling in older people with osteoporosis and/or frailty was evident, but appears to be under-reported in the literature.
- In-hospital fractures related to specific moving and handling interventions appear to be uncommon, according to healthcare staff reports, and where these occurred they had been addressed at the time by clinicians and reported through the established patient safety procedures.
- Staff acknowledged the difficulty of establishing the cause of an in-hospital fracture, for example a fall could be either the cause of a hip fracture or a spontaneous fracture could lead to a fall. Added to this, falls and fracture can be unwitnessed and the patient may not be aware which came first. Furthermore, the difficulty of establishing the cause of an in-hospital fracture using hospital records was highlighted by many staff participants. They also reported increased rigour in documentation of patient safety incidents over recent years. MH Advisers also regularly reviewed data on patient safety incidents including falls, in-hospital low trauma fractures, and manual handling adverse events, as did clinical managers. The majority of patient participants who experienced low trauma fracture in the current exploratory study attributed this to falls (in the community), to no specific antecedent event, and just one participant reporting rib fractures had occurred in the past apparently due to positioning for an investigative procedure.
- Current NHS Manual Handling guidelines and staff education systems emphasise generic principles of safe and effective moving and handling for all staff. Manual Handling guidelines aim to be applicable across the range of healthcare contexts (and there are specific guidelines for bariatric, paediatric and spinal injury cases). 'Therapeutic handling', in contrast to normal 'care handling', is practised by designated healthcare professionals (Physiotherapists and Occupational Therapists) who have undergone specific preparation and competence assessment for this advanced role.
- A range of NHS healthcare staff reported improved knowledge and understanding of osteoporosis following participation in an experiential workshop and clinical simulation intervention delivered in NHS settings in phase two of the project. The latter involved the use of 'Osteoporosis Simulation Suits'.
- A complex education intervention *Caring for my bones* was developed during phase three, and included preparation of education video materials in collaboration with the university manual handling education team, NHS specialists and university media colleagues.

- An interactive website was commissioned and designed in collaboration with external IT company 'Planys Cloud', frontline staff, patients, NHS specialists, academics, learning technologists and external IT consultants. This work clearly built on the findings of the preceding phases. It was positively evaluated when initially launched at a Stakeholder Conference. Subsequently, two months later after a period of testing and application of fixes, website users, academic colleagues and postgraduate nursing students were invited to complete an online anonymised evaluation survey of the website and the responses received were very positive. As well as general information about osteoporosis, this showcased elements of the new 'Caring for my bones' online education package. The website also has niche social network features that can be accessed by all visitors. The opportunities afforded by these features will be maximised as the website community grows.

Overall Conclusions:

- There is a need for increased awareness of osteoporosis amongst healthcare professionals in acute care settings as many underestimated its prevalence in the older population. Some had not considered particular implications of the condition for nursing care and/or moving and handling. During the interviews and on critical reflection it appeared that adjustments were often woven into their practice if they were aware of a confirmed diagnosis of osteoporosis or if they suspected that osteoporosis could be present. Where people have a confirmed diagnosis of osteoporosis this needs to be highlighted to all in the clinical team including potential implications for moving and handling.
- Patients considered staff knowledge of their condition was highly variable, ranging from excellent levels of knowledge and understanding in osteoporosis and fracture liaison specialists and medical consultants in the field, to a very limited knowledge and awareness by some frontline staff in acute settings. Reasons for the latter include the complex nature of the disease and its presentation as it is often undiagnosed. Staff may have had little exposure to education about osteoporosis in their initial or ongoing continuing education. Osteoporosis is often one of a number of co-morbidities in older people and not necessarily the reason for admission, and implications for practice are not widely discussed.
- The findings indicate that implementation of evidence into practice is complex. Whilst all have access to up to date information the extent to which all staff actively engage with this and are able to integrate it in to their practice is an important area for ongoing research and education.
- A multi-faceted dissemination strategy is necessary to reach a wide range of healthcare audiences and the general public. Healthcare professionals and researchers can address this requirement with other specialists when resources permit.
- Overall, the Lydia Osteoporosis Project provided evidence to support the development of online education modules focusing on complex healthcare interventions that are delivered by healthcare professionals. The Acute Model of the Lydia Osteoporosis Project developed in the LOP is currently being further adapted and tested in acute settings in a second project (LOP 2). Ultimately, the project team would also plan to develop a Community Model of the Lydia Osteoporosis Project to focus on the older population with osteoporosis that is living at home or in nursing or residential care settings and enhancing the education provision for health and social care practitioners in the community context.

Work in progress:

The second Lydia Osteoporosis Project (LOP 2) focuses on the wider dissemination of research findings and implementation of a complex education intervention from the first Lydia Osteoporosis Project. LOP 2 involves adapting an online complex education intervention (an output from Phase 3 of the LOP) to the local context in collaboration with clinical staff, and the co-production of suitable implementation strategies. LOP 2 is located within the discipline of Implementation Science as this can make a crucial contribution to the translation of robust research evidence into practice, a central concern of all practice disciplines. It is using an Action Research and process evaluation approach (Reason & Bradbury 2006, McCormack 2015) and draws on robust sociological and psychological theories and the Promoting Action on Research Implementation in Health Services (PARIHS) conceptual framework (Harvey & Kitson 2015). This project is enriched by the collaborative links with NHS clinicians and researchers established through the LOP.



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