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The recovery process after a hip fracture of healthy patients, 65 years and older -perceptions, abilities, and strategies

BERIT GESAR | FACULTY OF MEDICINE | LUND UNIVERSITY



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DOCTORAL DISSERTATION

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The recovery process after a hip fracture of healthy patients, 65 years and older -perceptions, abilities, and strategies		
<p>Background: A hip fracture is a common cause of morbidity, functional disability, and decreased health-related quality of life (HRQOL). With demographic changes showing a growing proportion of older people, hip fractures will be an increasing challenge for healthcare services in the future. Hip fractures threaten the independence of individuals in their everyday lives. In Sweden, more than one third of those who sustain a hip fracture are healthy and live independently before the hip fracture, but of that number, 40 percent do not regain pre-fracture functional capability. In terms of adults who lived independently and who are at risk of declined functions after a hip fracture, the recovery process should improve their chances to recover, to avoid disability, and to maintain independence.</p> <p>Aim: The overall aim of this study was to garner knowledge about the views of patients, their experiences, perceptions, and strategies for recovery after hip fracture surgery in order to design a feasibility study for an intervention.</p> <p>Method: Studies I and II were explorative interviews with an inductive qualitative design. Study III was a register/questionnaire study with patient-reported outcome measures. Study IV, a feasibility study protocol with a single-case experimental design, is based on the results from studies I, II, and III. The purpose of this feasibility study will determine whether the intended intervention is appropriate for further testing in a full-scale intervention. The sample is previously healthy independent living older adults in Sweden.</p> <p>Results: Initially at the acute hospital, all the patients believed in recovery and in re-establishing everyday life. However, the conviction patients had in terms of regaining everyday life transitioned into a sense of passivity about whether and how they would recover. This was due to adapting to the culture of the ward at the acute hospital. The follow-up interviews four months later showed that the hip fracture still had consequences for everyday life. The physical restraints had psychological; while conversely, the psychological effects influenced physical recovery. The register questionnaire study (III) showed that after four months, only 21 percent of the previously healthy adults assessed themselves as almost fully or fully recovered. Different age groups reported different challenges on the two observed occasions.</p> <p>Conclusion: This thesis demonstrates that previously healthy older adults who lived independently before do not receive sufficient support after a hip fracture. These patients should have the potential to recover to previous function capability and to re-establish their everyday lives. Person-centred care provided by an inter-professional team could result in optimal individual outcomes for this patient group</p>		
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*”Ibland måste man göra saker man inte vågar,
annars är man ingen människa utan bara en liten lort”*

Astrid Lindgren. Ur Bröderna Lejonhjärta

*“Jag har inget emot att dö, bara inte i morgon,
jag har en del jag skall göra först”*

Astrid Lindgren. Ur Emil i Lönneberga

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Original papers

This thesis is based on the following papers referred to in the text by their Roman numerals:

- I. **Gesar B**, Hommel A, Hedin H, Baath C. Older patients' perception of their own capacity to regain pre-fracture function after hip fracture surgery - an explorative qualitative study. *International Journal of Orthopaedic and Trauma Nursing*. 2017 Feb;24:50-58.
doi: 10.1016/j.ijotn.2016.04.005
- II. **Gesar B**, Baath C, Hedin H, Hommel A. Hip fracture; an interruption that has consequences four months later. A qualitative study. *International Journal of Orthopaedic and Trauma Nursing*. 2017 Aug;26:43-8. 2017. doi: 10.1016/j.ijotn.2017.04.002
- III. **Gesar B**. Baath C, Hedin H., Hommel A. Patient reported outcomes at acute hospital stay and four months after hip fracture surgery. A register and questionnaire study. *European Journal for Person Centred Healthcare*. 2018;6(1):xx-xx. (Accepted)
- IV. **Gesar B**. Baath C, Hedin H., Hommel A. Improving patient recovery after hip fracture surgery. Protocol for a feasibility study. *Pilot and Feasibility studies (In manuscript)*

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Abbreviations

ASA	American Society of Anaesthesiologists
EQ-5D	EuroQol 5 Dimensions
FES(S)	Falls Efficacy Scale (Swedish version)
FoF	Fear of Falling
HRQOL	Health Related Quality of Life
IADL	Instrumental Activities of Daily Life
PADL	Personal Activities of Daily Living
PREM	Patient Reported Experience Measure
PROM	Patient Related Outcome Measure
PRP	Postoperative Recovery Profile
RN	Registered Nurse
SPIRIT	Standard Protocol Items: Recommendations for Interventional Trials
STROBE	Standard Protocol Items: Statement for Observational Studies
VAS	Visual Analogue Scale

Abstract

Background: A hip fracture is a common cause of morbidity, functional disability, and decreased health-related quality of life (HRQOL). With demographic changes showing a growing proportion of older people, hip fractures will be an increasing challenge for healthcare services in the future. Hip fractures threaten the independence of individuals in their everyday lives. In Sweden, more than one third of those who sustain a hip fracture are healthy and live independently before the hip fracture, but of that number, 40 percent do not regain pre-fracture functional capability. In terms of adults who lived independently and who are at risk of declined functions after a hip fracture, the recovery process should improve their chances to recover, to avoid disability, and to maintain independence.

Aim: The overall aim of this study was to garner knowledge about the views of patients, their experiences, perceptions, and strategies for recovery after hip fracture surgery in order to design a feasibility study for an intervention.

Method: Studies I and II were explorative interviews with an inductive qualitative design. Study III was a register/questionnaire study with patient-reported outcome measures. Study IV, a feasibility study protocol with a single-case experimental design, is based on the results from studies I, II, and III. The purpose of this feasibility study will determine whether the intended intervention is appropriate for further testing in a full-scale intervention. The sample is previously healthy independent living older adults in Sweden.

Results: Initially at the acute hospital, all the patients believed in recovery and in re-establishing everyday life. However, the conviction patients had in terms of regaining everyday life transited into a sense of passivity about whether and how they would recover. This was due to adapting to the culture of the ward at the acute hospital. The follow-up interviews four months later showed that the hip fracture

still had consequences for everyday life. The physical restraints had psychological; while conversely, the psychological effects influenced physical recovery. The register questionnaire study (III) showed that after four months, only 21 percent of the previously healthy adults assessed themselves as almost fully or fully recovered. Different age groups reported different challenges on the two observed occasions.

Conclusion: This thesis demonstrates that previously healthy older adults who lived independently before do not receive sufficient support after a hip fracture. These patients should have the potential to recover to previous function capability and to re-establish their everyday lives. Person-centred care provided by an inter-professional team could result in optimal individual outcomes for this patient group.

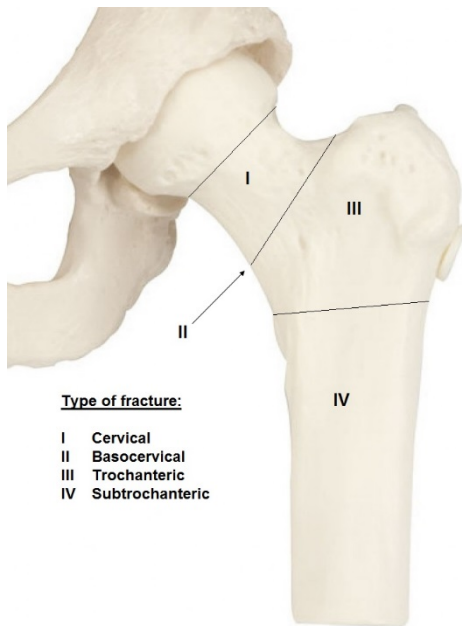
Introduction

Hip fracture

The sustaining of a hip fracture is a sudden event that threatens many aspects of life. It is one of the most severe consequences of falls in the elderly population because it can result in significant loss of functions and increased morbidity (1). Scandinavia has the highest rate of hip fracture in the world (2). In Sweden, the incidence is nearly 18000 every year. The risk of sustaining a hip fracture increases with age. The mean age (2014) was 83.5 (women), and 80.9 (men), with 45 percent living alone before the fracture. The ASA-classification showed that men have a poorer health status and therefore are more likely to suffer postoperative morbidity (3).

The surgical techniques for different types of hip fractures have improved over recent decades, while further medical research projects are ongoing (4). Hip fracture is a comprehensive term for different types of hip fractures. The type of hip fracture that this thesis focuses on is a fragility fracture because of osteoporosis combined with a fall from either standing height or lower (3).

There are six different types of hip fractures depending on which skeletal component is involved, and this underlies the decision as to which of the various surgery techniques that is preferred (5). The different hip fracture types are divided into two main categories, *cervical fracture* (undisplaced cervical fracture 13%, displaced cervical fracture 37%) and a fracture distal to the femoral neck *trochanteric fracture* (Trochanteric two fragments fracture 19%, trochanteric fracture multi fragments 20%, and subtrochanteric fracture 8%). The intermediate type of hip fracture is called *basocervical* 3% (5) (Figure 1).



- Type of fracture:**
- I Cervical
 - II Basocervical
 - III Trochanteric
 - IV Subtrochanteric

Figure 1. Types of hip fracture¹

The National Quality Register *Rikshöft*

The first Swedish National Quality Register (NQR) was established in the year 1975: this was the Swedish Knee Arthroplasty Register (SKAR) (6). The NQR *Rikshöft* in which patients with a hip fracture are registered started in 1988. Sweden has a unique resource in the NQR and in this current year, 2018, Sweden has 108 NQRs. They are permitted for use in an integrated and active way for continuous learning, improvement, research, and management to create the best possible health

¹ Figure based on a drawing from Universal Medicals.

<https://www.universalmedicalinc.com/female-pelvic-skeleton-with-movable-femur-heads.html>

and care together with the individual. The emphasis of the various registries may vary. Some focus on patients with a specific illness, others on a particular treatment or risk group like *Rikshöft*. Therefore, the NQRs are entirely different, with different levels of coverage and data quality (6).

In the NQR *Rikshöft*, patients with different types of fragility hip fractures and the different surgical methods are included (3). The coverage in the year 2013 and 2014, when the studies presented in this thesis were conducted, was 85.1 percent versus 86.3 percent when *Rikshöft* is compared with data from the National Board of Health and Welfare. However, the National Board of Health and Welfare does not include patients who are not operated on. If patients have a hip fracture on both sides, only one fracture is registered, and patients who are re-operated on cannot be excluded in the register. Therefore, there is a difference in coverage between *Rikshöft* and the National Board of Health and Welfare. All participating clinics have constant access to their own data so that they can work with different quality improvements (3,5, 6).

The NQR *Rikshöft* contains data on diagnoses, interventions, inpatient care, PROM (EQ-5D), and other patient-reported health effects, four-month follow-ups (see appendices 1- 5), and reoperations. Many county councils use different parameters in *Rikshöft* as quality indicators to monitor their care processes. The time from arrival at the hospital until the time the patient undergoes surgery is a national quality indicator in open comparisons: 80 percent are supposed to be operated on within 24 hours to decrease the risk of complications (5). *Rikshöft* makes it possible to evaluate the continuum of care and resource utilisation, and has been used as a tool to audit items in terms of the fundamentals of care for older patients with hip fractures (7).

Osteoporosis

Osteoporosis is a silent, asymptomatic disease characterised by reduced bone mass resulting in increased bone fragility and increased fracture risk (8). The peak in bone mass and skeletal strength is between the ages of 20 and 30, and depends on heredity and lifestyle factors (9).

Osteoporosis is a disease most common in the population after the age of 50 years. The lifetime risk of sustaining an osteoporotic fragility fracture increases with age, and about 90 percent of the fractures are sustained by patients 60 years and older (9). In the remaining lifetime after the age of 50 years, the likelihood of a person sustaining a fragility fracture is 40-51 percent (women) and 18-23 percent (men). The incidence increases progressively with age because of reduced bone mass and weakened bone structure (8-10). A fragility fracture is when a similar fall should not result in a fracture (10). The incidence of osteoporosis is four times more common in women than in men, and is most often present upon a fracture of the hip, spine, forearm, or humerus. The reason why osteoporosis is more common in post-menopausal women is explained by accelerated bone turnover secondary to oestrogen deficiency (8).

One explanation for the relation between declined bone health and muscle strength is the senescence process. Functional disability increases, and this involves a higher risk of falls, which can result in fragility fractures, and increased morbidity and mortality. These adverse health events that result from ageing could be due to wasting muscles and decreased skeletal bone tissue known as sarcopenia and osteoporosis. The prevalence of these two disorders is expected to rise (11). Contrary results were shown in a study by Stone et al. (12), where less than one-third (28%) of patients with a hip fracture had higher values of Bone Mineral Density (BMD) than the cut-off for diagnosis of osteoporosis (12). However, the result showed that people who had low BMD values had lower muscle capability (low muscle mass, low muscle strength, low physical performance). These people had a higher probability of fragility fracture. When bone quality was compared, there were no differences between sarcopenic and non-sarcopenic men or women or between those with low and high muscle mass. The trabecular bone score was lower in women with low muscle strength and in older men with low physical performance. These results show that there is a relationship between muscle impairment and bone health (13).

Gerontology

Ageing is a slow, continuous process that can be viewed from a biological, psychological and social perspective. Gerontology consists of three elements: a) biological ageing, the individual's current age in regards to the average potential lifespan; b) psychological ageing, the individual's ability to adapt to change concerning internal and external conditions and factors; and c) social ageing, changes in age-related constructs in a socio-cultural context (14). Biological and physical ageing is a time-dependent, progressive degradation of all cellular and physical functions in the human body: it creeps in slowly, is irreversible, and occurs in conjunction with increased chronological age (15, 16). As a person ages, the reproduction of cells in internal tissue declines. The decline occurs with different intensity for different individuals and in terms of impact on both physiological and psychological functions, and leads to a higher risk of age-related diseases (14). With that in mind, personal health is strongly dependent on how the individual adapts to this continuous process – for instance, how one's position in the social hierarchy changes and how self-awareness increases with age (17).

Biological ageing

Biological ageing represents degradation of tissues and a gradual reduction in physical functions and reserve capacity (18, 19). Every specific health condition that threatens a decline in physical function increases the sensitivity for age-related diseases and decreases resistance to stress and physiological and psychological strain (19). Increased age contributes to a decrease in bone density, while the muscle tissue also declines in terms of mass, physical strength, and number of muscle fibres (19, 20). Between the ages of 50 and 80, muscle strength declines between 30 to 60 percent (19). Humans retain good physical and psychological capabilities up until at least the age of 80-85 unless they suffer from illness and disability (20). This is also true of people who are even older, and there is a close relationship between function capability and experienced life quality at an old age (21, 22). Having enough physical strength to manage PADL independently is also a predictor of well-being (23, 24).

The size of the human brain decreases by 20-30 percent. Age-related reduced cerebral grey volume and increase in cerebral white volume are strongly linked to loss of functions and movement deficits such as slow speed and shorter steps (25). The brain's production of dopamine is crucial for physical movement. As the brain cells decline, the body's physical functions also do so (18).

Simultaneously, the ageing process causes an involution of the nervous system, which can lead to reduced walking capabilities, a decline in physical function, and reduced balance, which increases the risk of injuries caused by falling. Physical activity is the only documented action for an older person to retain and improve physical strength, stamina, balance, coordination, mobility, and functional capacity (26).

A broad range of cognitive functions declines with advanced age, such as memory, attention, and executive functions (17). A person's memory capacity reduces by around 1 percent every year after the age of 35. The ageing brain leads to the body being more susceptible to physical and psychological stress. It also takes longer for an older person to adapt to changes both in internal and external conditions (17, 28).

Acute delirium is a common complication in patients with a hip fracture during acute hospital stay (29). It is important to recognise signs of this unpleasant complication. The group of patients at risk are older people treated with anti-depressive, neuroleptic, benzodiazepine or drugs with anticholinergic effect before the hip fracture. Shortly before undergone some surgery is also a risk factor for acute delirium (30). Delirium is classified in three different types; a) hyperactive-hyper alert (exhibited restlessness/agitation, aggressive behaviour) b) hypoactive-hypo alert (decreased reactivity, motor and speech retardation and facial inexpressiveness), and c) a mixed type (psychotic and emotional symptoms) (31, 32). The hyperactive-hyper alert type is most common in patients diagnosed with dementia and hypoactive delirium is more frequent in older people without dementia. There are no differences between the non-dementia and the dementia group regarding hyperactive symptoms (30).

Research has identified eight frailty indicators that strongly connect to limitations in physical and psychological activities: fatigue, physical weakness, physical

stamina, weight loss, low physical activity, reduced balance, reduced cognition, and impaired vision (33). Because of threatening upcoming losses among frail older people, there is a risk of a life transition in both physical, psychological and social areas, and a threat of becoming lonely (34). To support the individual to maintain previous health, and promote the patient to regain previous health status is vital (35). Consensus has not been reached in different reports whether disability is a component or an outcome of frailty (36, 37).

Psychological ageing

The psychology of ageing represents the individual's ability to adapt to change in terms of internal and external conditions and factors. The psychological aspects of ageing embrace cognitive functions such as memory, language, knowledge, mental agility, decision-making, and cognitive well-being: this includes aspects such as the person's ability to make decisions on tasks concerning oneself (17). Psychological well-being in people 80 years and older can be divided into two dimensions: subjective well-being describes a person's inner feelings about the ageing process and psychological well-being describes external circumstances that contribute to the well-being of an ageing person (21, 38). The complexity of the ageing body means less comprehensive coping mechanisms when an unexpected life event is happening. When caring involves elderly people, it is vital to understand that the rehabilitation process is time consuming and is lasting for a long time (39).

Social ageing

In general, people experience high quality of life as long as they retain both meaningful social relationships and the sense that they are in control of their own personal lives, both physically and in regards to their social environment (40, 41, 43). Older people who lack social support have a lower quality of life compared with those who do have social support. These people also demonstrate more signs of depression (42).

People suffering from hip fractures, where the mean age was 82 years in Sweden (2014) (3), are generally considered and researched as a uniform group (2, 10, 11). A hip fracture is not a chronic disease, and healthy older adults should therefore, be able to regain their pre-fracture function (7).

Fear of falling

Falling is among the most common and severe problems facing older people. Decreased muscle mass and delayed muscle function hamper the body so that it cannot self-regulate fast enough when balance control is starting to fail (26, 44). The risk of falling increases when a person is not physically active due to a decrease in muscle strength and balance (45). Falls in older people often coincide with increased age, declined muscle strength, balance disorders, visual problems, sarcopenia, frailty, polypharmacy, and factors in the environment (26).

Fear of falling (FoF) is common in people who have fallen once or more. It is a phenomenon that results in a negative spiral because of restrictions in physical activities; furthermore, less involvement in social activities results in a loss in self-confidence, a further decline in involvement in activities, and increased dependence on help from others (44-46). Older people who are afraid of falling avoid doing activities that could entail marginal risks in everyday life. They compromise between safety and functional independence, and may avoid certain activities or choose to rely on help (44, 47). FoF can also reflect the fear of being unable to get up or of being injured, and this can lead to dependency on help from others. Experiencing a fall can result in decreased quality of life because the anticipated risk of falling may prevent participation in activities that have health benefits (44). Conversely, patients may have to accept the risk of serious injury if they wish to continue activities that are beyond their balance capability (45).

Tinetti et al. (48) constructed the Falls Efficacy Scale (FES) that was intended to assess low perceived self-efficacy and fear of falling when specific tasks are being performed (48). However, further research distinguishes between FoF and self-efficacy, and argues that these are two separate constructs. Falls self-efficacy is more likely to assess the person's function capability and is not associated with a fear of falling (49). The Swedish version (FES(S)) is a multi-item questionnaire for self-assessment of perceived subjective evaluation of one's ability to complete a task without falling. The Swedish version was extended to 13 items from ten. The additional items are 'get in/out of bed', 'get on/off toilet', and 'personal grooming' (50). It is important to distinguish between patient-reported self-efficacy to perform

certain activities and fear of falling when performing these activities. The assessment of the patient-reported ability to complete a task without falling is clinically significant for incorporating fall-prevention into clinical practice. The FES indicates which individuals have reduced ability when it comes to PADL (51).

Health-related quality of life

To assess patient outcomes after a hip fracture, Health-Related Quality of Life (HRQOL) is measured. The World Health Organisation (WHO) defines HRQOL as being a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity (52). These areas are given focus so as to assess how a hip fracture affects the health status of patients using EQ-5D in the NQR *Rikshöft* (5).

The sustaining of a hip fracture is in many aspects similar to being forced into a transition into a new phase in life. In contrast to gradual ageing, a hip fracture often brings an unexpected (but hopefully passing) change in lifestyle. The effect of a hip fracture on activity and health may depend on the individual coping strategies exhibited by the patient (23, 53). The hip fracture can be looked on as being simply one life event in the lifetime of an individual. To describe healthy ageing is complicated. Earlier life experiences can result in different abilities to cope with change (43), and the hip fracture might have a disparate impact depending on what time in a person's life it occurs (53) (Figure 2).

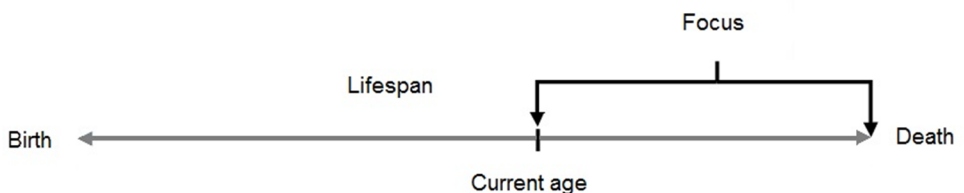


Figure 2. Focus on the remaining years

Successful ageing involves people's responses to changes during their lifetime. This transition process is a personal reorientation and self-redefinition during efforts to maintain various functions; further, it is about coping and remaining in control of one's life in the face of disabilities (54). Older habits and interests are strong

predictors when it comes to activity as the patient grows older, and the ageing person will strive to retain activity patterns by adapting them to his or her current ability and needs (55).

Activities that involve human interactions promote well-being by affirming a person's role and identity. Changes in and loss of old positions are thought to have a negative impact on self-image and well-being. Especially crucial when it comes to the health of older people is human interaction based on the grade of relational intimacy in both essential and leisure-time activities (56). The personal level of resilience, combined with the quality of social interactions, influences perceived stress and self-rated successful ageing, and serves as a link between disability and poor well-being in older adults (57).

Rehabilitation after surgery demands energy and serves to help patients regain their preoperative daily activity level and sense of well-being. To restore life to how it was prior to the hip fracture, patients need to regain control over physical, psychological, and social functions (58, 59).

Instead of efforts to achieve as high an activity level as possible, the focus could instead be on finding a balance between the ideal living situation and the actual situation that the person finds him-/herself in (42). The guide for the promotion of health and well-being in older age depends on self-rated involvement in meaningful activities and active involvement in life (60, 61). One could say that such actions in the regaining of good health will bring about a sort of upward spiral. From this perspective, it is vital to avoid the downward spiral that can threaten a person's ability to interact socially (42).

The home environment plays a significant role in the development and support of personal strategies for healthy ageing (62, 63). Essential to optimal health when it comes to ageing – especially for ancient people – are the characteristics of the home, a place that represents the individual's intrinsic value and the feeling of being unique, both of which promote the self-perception of having retained health in old age (64-66). This results from the feeling of being in control, of self-determination in terms of daily activities with retained autonomy, and of having a reason to strive

for independence. Strategies for coping help individuals feel as though they are in control and able to take the initiative (22, 63).

To generalise and argue that life quality is the same for the different age group samples – young-old, old-old and oldest old – may be inappropriate (42, 67). The most appropriate way to define healthy ageing is to determine the concept described by older people themselves. Healthy ageing means ‘having a sense of wellbeing, the capacity for independent activity, meaningful involvement, supportive environments and positive attitudes. Being healthy is seen as having resources for an everyday life that is satisfying to oneself and others (54, 68).

Person-centred care

Core to person-centred care is collaboration and partnership between the patient and all the healthcare professionals. Person-centred care embraces patient participation, respect, and self-determination. This relationship is underpinned by values of respect for the individual, the right of the individual to self-determination, mutual respect, and understanding (69). This is possible by modifying the context and improving the cultures of empowerment that foster continuous approaches to practice development (70, 71).

Patient-centred care includes understanding the person’s feelings, experiences, and expectations when it comes to a disease, i.e. to have an understanding of what the disease actually means within their unique psychosocial context. This will orient nursing practice so that there is a collaboration with the patient as well as the development of achievable short-term and long-term goals fitting with the actual context (72). Different healthcare providers tend to emphasise widely different parts as the basis of the concept of person-centred healthcare (69).

Central to both fundamentals of care and person-centred care is the ability of care providers to establish positive relationships with patients. The promotion of person-centredness in acute care is well rehearsed, with widespread acceptance of the principles that underpin such an approach (71). These aspects might affect both the possibility to change the organisational culture as well as the practical implementation of person-centred healthcare (73).

For care to develop so that it is person-centred, certain fundamental “ingredients” must be in place, according to McCormack and McCance (71): These are 1) Prerequisites: focus on attributes of the nurse (professional, competent, and committed to the job); 2) The care environment: focus on care-surroundings including an appropriate skill mix with shared decision-making and power-sharing, organisational systems that support such an effort, and the potential for innovation and risk-taking; 3) Person-centred processes: values in delivering care with respect for patients’ beliefs, values and allowing shared decision-making; 4) Expected outcomes (71). The context is multifactorial and complex. A helpful context for the implementation of person-centred care requires dedicated care providers, supportive organisational leaders, systems and an appropriate skill mix, participation and commitment to collaborate in and between the inter-professional teams, power-sharing and non-hierarchical relationships to achieve best patient outcomes with patient involvement (71). The two interview studies in this thesis (studies I and II), showed that the involvement of patients in their own care was limited at the acute hospital. The fragmented care at the acute hospital showed an imbalance in power. It turned out that the older adults who had recently undergone hip fracture surgery were vulnerable. The patients lacked psychological support aimed at helping them gain the conviction they needed to re-establish everyday life and independence post-hip fracture (study I). Lack of support in performing everyday tasks was also described at the four-month follow-up. They felt that recovery was entirely their own responsibility. There were challenges that were essential in the retaining of self-esteem and in coping with the long-term recovery (study II). The results in study III showed that older adults who had previously lived independently experienced different stages of challenges at various stages of the recovery phase. The importance of individual support during recovery after a hip fracture and encouraging older adults to understand the benefits of carrying out daily activities on their own may result in their regaining previous functional capacity.

Complex intervention and feasibility

The development stage of an intervention should be well founded on the best available evidence, ideally from systematic reviews. In a complex intervention, it is essential to have a theoretical understanding of the different components in the process of changes, as well as an understanding of the model process and outcomes – that is to say, the feasibility. The implementation considerations should guide all phases so that the question as to whether or not the intervention is feasible can be answered (74,75).

A complex intervention is multifactorial in nature when multiple interactive components are involved. These composite components are supposed to serve as findings of the circumstances of the individual patient, healthcare professionals, and the number and variability of outcomes. How those components interact and how this affects the outcome of an intervention is essential to the intervention (74). To develop and evaluate a complex intervention is an iterative process, not a linear process (74, 75). The critical question is both to determine whether the intervention works as well as to determine what works, who it works for, what circumstances it works in, and why (75).

A feasibility study is a pre-study that aims to gather information before the planning of a full-scale study (74-76). The measure of feasibility in this thesis is to estimate the attendance and attraction for patient participation. Further, it is to determine whether the healthcare professionals collaborate in a way that improves appropriate patient participation (74, 75). Outcomes in a feasibility study will be information as to whether or not the study is feasible and whether or not the intervention is suitable for modifications. Before starting up a feasibility/pilot trial, it is important to identify possible interacting components in the context, and to investigate whether there are sufficient skills that will allow delivery of best praxis. Those who provide and receive the intervention relate the complexity to the requirements of behaviour changes (75, 77). A feasibility study will estimate the likely rates of recruitment and retention, and will serve to provide the primary data so that the sample sizes can be calculated before a full-scale trial commences. The feasibility study is a pilot study that is completed ahead of the main study as a means of answering the question, “Can this be done”? (74-76).

Rationale for the thesis

Hip fractures present a significant challenge for the patient, the Swedish healthcare system, and Swedish society. Consequences of a hip fracture can include functional disability and increased dependency, which are serious for older people. The incidence of hip fracture is increasing substantially as a result of a continuously ageing population, where osteoporosis and falls are combined factors (78).

In Sweden, the annual incidence of hip fractures is nearly 18 000. About 37 percent of this patient group were healthy and lived independently before the fracture, but only 40 percent regain their previous level of functional capacity (79). Previous research has tended to focus on surgical techniques (4), functional functions (80-83), complication rate (80), morbidity or mortality (81, 84, 85). The significance of psychological components such as fear of falling, self-confidence, and coping strategies in the recovery process is rather unexplored (53, 86, 87).

Patients sustaining a hip fracture are commonly studied as a homogeneous group (83, 85, 88, 89). Each patient is unique and has individual expectations. Hip fracture care includes the entire continuum of care. Previously healthy individuals who sustain a hip fracture should regain their pre-fracture functions. Although a hip fracture often is associated with poor outcomes, appropriate care can ensure optimal recovery to previous function capability. The frail but previously healthy older adults should be prioritised due to their individual capacity (11). By collaborating in an inter-professional team, it may be possible to optimise the recovery process after hip fracture surgery and avoid deterioration among previously independent living older adults (87). The focus of this thesis was, therefore, to use the reported experiences of patients and their outcomes as a means to contribute knowledge to improve clinical practice.

Aim

The overall aim of this study was to garner knowledge about the views of patients, their experiences, perceptions, and strategies for recovery after hip fracture surgery in order to design a feasibility study for an intervention.

Specific aims of the four studies were:

- I. To explore healthy older patients' perceptions of their own capacity to regain pre-fracture function in the acute phase following hip fracture surgery
- II. To reveal how previously healthy people, aged 65 years and older, described how they had adapted to daily life four months after a hip fracture
- III. To identify factors that predict how patients recover after hip fracture surgery
- IV. To assess the feasibility for an intervention to improve recovery after hip fracture surgery in healthy adults

Methods and materials

Design

This thesis includes four papers (I-IV). To address the overall aim, the combination of the following was used to develop a study protocol for a feasibility study: two studies with qualitative design, one with quantitative design, and one with single case experimental design (Table 1).

Table 1. Overview of the four studies of healthy adults who sustain a hip fracture

	Study I	Study II	Study III	Study IV
Participants	N=30 age 65-97	n=25 follow-up study age 65-97	N=188/n=160 age 65-105	N=60 age≤65
Design	Explorative, inductive, qualitative	Explorative, Inductive, qualitative	Quantitative, descriptive, register- questionnaire study	Single-case, experimental
Data collection	Interviews	Interviews	Quality register questionnaires	Quality register questionnaires
Data analysis	Manifest inductive content analysis	Conventional inductive content analysis	Descriptive statistics	Descriptive statistics

ASA- classification	
ASA Physical Status I	A normal healthy patient
ASA Physical Status II	A patient with mild systematic disease
ASA Physical Status III	A patient with severe systematic disease
ASA Physical Status IV	A patient with severe systematic disease that is constant threat to life
ASA Physical Status V	A moribund patient who is not expected to survive without the operation

Figure 3. The physical status classification system, American Society of Anaesthesiologists (ASA)

The qualitative studies, study I and study II

Study I

Settings and sample

Study I took place in five orthopaedic wards at three hospitals: one university hospital in southern Sweden and two central hospitals in central Sweden. Ten patients from each hospital were invited to take part in study I after their hip fracture surgery. A convenience sampling procedure was used. Inclusion criteria were: A) age 65 years or older; B) classified in the American Society of Anaesthesiologists as ASA I = (healthy) or ASA II = (mild systemic disease) (90) (Figure 3), C) the ability to speak and understand Swedish, and D) no cognitive impairment (Pfeiffer-test 8-10) (91). Three men and 27 women, mean age 83.1 years (range 65-97 years) participated. Three men and 27 women, mean age 83.1 years (range 65-97 years) participated. All 30 patients were admitted from their own home and lived independently before the hip fracture.

Procedure

When a patient was eligible for inclusion, the RN responsible for the nursing care informed the patient about the study and collected the signed informed consent

document. All the individual interviews were carried out in a room at the hospital without any disturbance. The semi-structured interview guide included open-ended questions and began with opening questions concerning the accident and the patient's current state of health (92). The following questions were constructed in order to answer the aim of this study, and started with 'Can you tell me something about your everyday life (what is most important, least important)?'; 'How do you feel about your ability to return to everyday life the way it was before the hip fracture?'; 'How do you feel about your own ability to regain pre-fracture functions in your everyday life?'. The interviews lasted between 35 and 60 minutes, and were tape-recorded and transcribed verbatim.

Study II

Settings and sample

Of the 30 patients from study I, 25 agreed to participate in this follow-up interview study four months after they received hip fracture surgery: there were three men and 22 women, mean age 83.3 (range 65-97 years). The reasons why there were only 25 were that one patient had died, two had developed dementia symptoms, and two declined without explaining the reason. In keeping with the preferences of the patients, the interviews were carried out by BG in their homes (n=24) and at a café (n=1).

Procedure

The participants were contacted by telephone to make an appointment for the follow-up, semi-structured interviews with open-ended questions, which were conducted four months after the hip fracture. The introduction to the interview concerned thoughts about the accident, i.e. the fall, experiences from their time in the hospital, and their life situation over the last four months. The following questions were constructed in order to answer the aim of this study and started with 'can you tell me something about': 'your everyday life (what is most important, least important)', 'how you feel about your possibilities of returning to everyday life the way it was before the hip fracture', 'how you feel about your own ability to regain pre-fracture functions in everyday life', 'where you would position yourself in comparison to other people around your age regarding factors connected to the

injury and rehabilitation'. The interviews were carried out as narratives with the focus on getting answers to the questions in the interview guide. The interviews lasted between 38 and 63 minutes, and were tape-recorded and transcribed verbatim.

The data for studies I and II was collected during the period August 2013 – April 2014.

Data analysis studies I and II

As no pre-existing theory was apparent in either study, studies I and II were analysed with inductive content analysis. The text data of study I was analysed using manifest inductive content analysis described by Elo and Kyngas (93). The text data of study II was analysed using conventional inductive content analysis inspired by Hsieh and Shannon (94).

The written transcripts were read several times so that their content could be grasped and a sense of the whole obtained. The unit of analysis was selected based on the aim of the study. The organisational phase started with open coding together with written headings that were organised on coding sheets. After the coding of 15 transcripts was completed, the preliminary labels of codes were discussed and reviewed in several meetings within the research group so that agreement could be reached. Several times this process moved back and forth between data and headings that had been developed. From this stage, the steps involved in the analysis of data in studies I and II are described separately below.

Study I. The headings of the coding sheets were joined together by gathering those with similar contents into higher order sub-categories covering the meaning. To ensure that data accurately represented the data text, similar sub-categories were grouped into higher order generic categories. This was the stage of interpretation degree. The sub-categories, generic categories, and main category were reviewed back and forth once again, and a final decision was made. The last step, the reporting phase, resulted in one main category that was generated from three generic categories and six sub-categories to describe the content of the written material (Figure 5).

Study II. When new labels for codes were discovered, they were combined into an existing sub-category. Some of them were renamed because of abstraction. This was

the stage of interpretation degree. Sub-categories were added to the sheet when labels of codes did not fit into an existing one. All transcripts were coded, reviewed, and cross-examined until no disagreement remained in the research group. The results of the data analysis, the reporting phase, resulted in four sub-categories and one category describing the content of the data (Figure 6).

Demographical and clinical data of included patients in the studies I and II are presented in table 2.

Table 2. Demographical and clinical data of included patients in the studies I and II

	Study I N=30	Study II N=25
Gender n (%)		
Women	27 (90.0)	22 (88.0)
Men	3 (10.0)	3 (12.0)
Age m (SD)	83.1 (\pm 8.3)	82.5 (8.5)
Age groups n (%)		
65-74	6 (20.0)	5 (20.0)
75-84	11 (36.7)	11 (44.0)
85-105	13 (43.3)	10 (40.0)
Admitted from n (%)		
Own home	30 (100.0)	22 (88.0)
Sheltered housing	0	3 (12.0)
Acute hospital	0	0
Living alone n (%)		
Yes	21 (70.0)	17 (68.0)
No	9 (30.0)	8 (32.0)
Mobility n (%)		
Walked alone out of doors	30 (100.0)	11 (44.0)
Walked out of doors only if accompanied	0	0
Walked alone indoors but not out of doors	0	13 (52.0)
Walked indoors only if accompanied	0	1 (4.0)
Unable to walk	0	
Walking aids n (%)		
Can walk without aids	21 (70.0)	6 (24.0)
Two aids		2 (8.0)
Frame/Rollator	9 (30.0)	16 (64.0)
Wheelchair/bedbound		1 (4.0)
ASA grade n (%)		
ASA 1	6 (20.0)	5 (20.0)
ASA 2	24 (80.0)	20 (80.0)

The quantitative study, study III

Settings and sample

Study III took place in five orthopaedic wards at three hospitals: one university hospital in southern Sweden and two central hospitals in central Sweden. The data was collected in the year 2014.

A consecutive sampling procedure was used. Inclusion criteria were the same as in studies I and II with the addition of “independent living situation before the fracture”.

Procedure

In total, 252 patients were invited to participate in the study as soon as was possible after surgery, and 188 (75%) agreed to participate. Of those who rejected participation, the mean age was 81.4 (± 9.7), with 47 women (73.4%) and 17 men (26.6%).

When a patient was eligible for inclusion, they received oral and written information about the study as soon as was possible after surgery from the RN responsible for their nursing care. The patients received information stating that they could withdraw at any time and that this would not affect their future care. If they chose to participate, they signed the informed consent document. At the acute hospital, 188 patients participated, and at the four-month follow-up, 160 patients participated (Table 3).

Table 3. Description of gender and mean age (SD) between the three hospitals

	University hospital N=72	Central hospital 1 N=86	Central hospital 2 N=30
Gender n (%)			
Women	58 (80.6)	67 (78.0)	22 (73.3)
Men	14 (19.4)	19 (22.0)	8 (26.7)
Age mean (SD)	79.1 (± 8.0)	82.5 (± 8.5)	80.4 (± 6.7)

Table 4. Demographical data of included patients before and at four months according to the Swedish NQR (*Rikshöft*) forms

	Before admission N=188	At 4 months N=160	P-value
Gender n (%)			.658
Women	147 (78.2)	127.0 (79.4)	
Men	41 (21.8)	33.0 (20.6)	
Age m (SD)	80.0 (8.1)	80.5 (7.6)	.023
Age groups n (%)			
65-74	50 (26.6)	43 (26.9)	
75-84	80 (42.5)	73 (45.6)	
85-105	58 (30.8)	44 (27.5)	
Admitted from n (%)			.001
Own home	181 (96.3)	153 (95.6)	
Sheltered housing	1 (0.5)	6 (3.8)	
Acute hospital	6 (3.2)	1 (0.6)	
Living alone n (%)			.025
Yes	108 (57.4)	90 (56.2)	
No	80 (42.6)	70 (43.8)	
Mobility n (%)			.001
Walked alone out of doors	175 (93.1)	112 (70.0)	
Walked out of doors only if accompanied	9 (4.8)	18 (11.2)	
Walked alone indoors but not out of doors	4 (2.1)	13 (8.1)	
Walked indoors only if accompanied	-	14 (8.8)	
Unable to walk	-	3 (1.9)	
Walking aids n (%)			.012
Can walk without aids	144 (76.3)	99 (61.9)	
Two aids	2 (1.1)	3 (1.9)	
Frame/Rollator	42 (22.3)	57 (35.6)	
Wheelchair/bedbound	-	1 (0.6)	
ASA grade n (%)			.027
ASA 1	35 (18.6)	33 (20.6)	
ASA 2	153 (81.4)	127 (79.4)	
Type of Fracture n (%)			.062
1.Undisplaced cervical fracture	30 (16.0)	26 (16.2)	
2.Displaced cervical fracture	78 (41.5)	68 (42.5)	
3.Basocervical fracture	6 (3.2)	6 (3.8)	
4.Trochanteric two fragments fracture	39 (20.7)	32 (20.0)	
5.Trochanteric fracture multi fragments	20 (10.6)	15 (9.4)	
6.Subtrochanteric fracture	15 (8.0)	13 (8.1)	

Table 5. Demographical data of patients with missing data at four months follow-up according to the Swedish National Hip Fracture Register (*Rikshöft*) forms

	Before admission (N=28)
Gender n (%)	
Women	20 (71.4)
Men	8 (28.6)
Age m (SD)	83.5 (10.1)
Age groups n (%)	
65-74	6 (21.4)
75-84	6 (21.4)
85-97	16 (57.2)
Admitted from n (%)	
Own home	28 (100.0)
Living alone n (%)	
Yes	20 (71.4)
No	8 (28.6)
Mobility n (%)	
Walked alone out of doors	25 (89.3)
Walked out of doors only if accompanied	2 (7.1)
Walked alone indoors but not out of doors	1 (3.6)
Walking aids n (%)	
Can walk without aids	17 (60.7)
Two aids	1(3.6)
Frame/Rollator	10 (35.7)
ASA grade n (%)	
ASA 1	1 (3.6)
ASA 2	27 (96.4)
Type of Fracture n (%)	
1.Undisplaced cervical fracture	5 (17.9)
2.Displaced cervical fracture	10 (35.6)
3.Basocervical fracture	0 (0.0)
4.Trochanteric two fragments fracture	7 (25.0)
5.Trochanteric fracture multi fragments	5 (17.9)
6.Subtrochanteric fracture	1(3.6)

Measurements

The Swedish NQR *Rikshöft* allows for comparative analysis of ward quality in different areas (5). The register consists of the collection of data during both the acute hospital stay and the four months after surgery (Table 6)

- *Rikshöft* Primary operation form1 (Appendix 1)
- *Rikshöft* EQ-5D(3L) Primary operation and 4 months follow-up (Appendix 2)
- *Rikshöft* Primary operation Qreg form (Appendix 3)
- *Rikshöft* 4 months follow up form 2 (Appendix 4)
- *Rikshöft* 4 months follow up Qreg form (Appendix 5)
- *Rikshöft* EQ-5D(5L) Primary operation and 4 months follow-up (Appendix 6)

Table 6. Measurements used in studies III and IV

Instrument	Measuring	Scoring range
<i>Rikshöft</i> Primary operation form1 (NQR)	Age, sex, living condition, mobility, the use of walking aids before the fracture, type of fracture, ASA-grade, waiting time for surgery, date of admission, length of hospital stay and location of discharge. <u>Nurse-sensitive quality indicators</u> : pain, incidence of pressure ulcers, acute confusion, wound infection, catheter-associated urinary tract infections and urinary retention.	Appendix 1
<i>Rikshöft</i> EQ-5D(3L) (Primary operation and 4 months follow-up)	HRQOL, mobility, self-care, usual activities, pain/discomfort and anxiety/depression	Three response options of severity: no problems, some or moderate problems and extreme problems. Appendix 2
<i>Rikshöft</i> Primary operation Qreg form (NQR)	The reason for the delay to operation and the incidence of, if any, complications	Appendix 3
<i>Rikshöft</i> 4 months follow-up form2 (NQR)	Pain, mobility and place of residence	Appendix 4
<i>Rikshöft</i> 4 months follow-up Qreg form. (NQR)	Incidence of, if any, complication	Appendix 5
<i>Rikshöft</i> EQ-5D(5L) (Primary operation and 4 months follow-up)	HRQOL, mobility, self-care, usual activities, pain/discomfort and anxiety/depression	Five response options of severity: no problems, slight problem, moderate problems, severe problems, unable to. Appendix 6
Falls Efficacy Scale, Swedish version (FES(S))	Perceived confidence in performing common everyday tasks without fear of falling	0-10; ↑score=higher confidence. 13 items divided in two subscales; PADL (6 items) & IADL (6 items), walking up-down stairs=the in-between item. Total sum score of 130 and 60/60 for each subscale. Appendix 7
Postoperative Recovery Profile (PRP) questionnaire	Perceived problems/difficulties in items comprised in five dimensions; physical symptoms, physical functions, psychological, social and activity	17 items acute/19 items at 4 months follow-up. Patients' perceived problems/difficulties formulated as statements assessed by the response categories <i>severe, moderate, mild, none</i> . Appendix 8 and Appendix 9

The EQ-5D (Three level) (Swedish version) is validity- and reliability-tested instrument, and is widely used in the measure of the health-related quality of life (HRQOL) (95, 96). It consists of a descriptive scale that comprises five dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. Each dimension contains three response options of severity: no problems, some or moderate problems, and extreme problems. An index value is attached to each EQ-5D state according to a particular set of weights that measure health status. The value 1 (assessed no problems at the five items) represents an optimal quality of life compared to the minimum value -0.595 (extreme assessed problems with the five items). The second part of EQ-5D is a 20 cm vertical visual analogue scale (EQ-5D VAS) in which patients rate their state of health from 0, worst imaginable health, to 100, best possible health (95). Since 2016, the EQ-5D (Three level) in the NQR *Rikshöft* was replaced with the EQ-5D (Five level) version (5) in purpose to enhance the applicability and improve the sensitivity of the mobility items (95).

The Falls Efficacy Scale, Swedish version (FES(S)) (Appendix 7), is a validated and reliability-tested multi-item questionnaire consisting of 13 items for self-assessment of perceived confidence in performing common everyday tasks without fear of falling (50). A higher score denotes better confidence when it comes to performing the activities.

The Postoperative Recovery Profile (PRP) questionnaire is a validated and reliability-tested multi-item questionnaire for self-assessment of postoperative recovery (97). The questionnaire comprises five dimensions: physical symptoms, physical functions, psychological, social, and activity. One version consisting of 17 items (Appendix 8), is aimed for use within 24 hours of surgery, and the follow-up consists of 19 items (Appendix 9), and is aimed for use after discharge. Items not included in the 17-item version are re-establishing everyday life and sexual activity. The PRP questionnaire provides recovery profiles at an individual and group level, both at the single item and dimensional levels. Patients' perceived problems/difficulties are formulated as statements, assessed by the response categories *severe, moderate, mild, none*.

Data analysis

Descriptive statistics were calculated in frequencies and proportions (%), mean [standard deviation] and median [interquartile range]. Comparisons between the two points of time were analysed using the two-sample t-test (mean-age), chi-square test for binary variables, and the Kruskal-Wallis test for categorical data (98-100). In all of the tests, the level of statistical significance was set at <0.05 . Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS), version 21.0 (IBM Corp, Armonk, New York).

The protocol for a feasibility study, study IV

The recommendations for Intervention Trials (SPIRIT) (101), were used for this protocol in accordance with the Medical Research Council (MRC) framework (74, 75).

Settings and sample

This study will be carried out at one orthopaedic ward at a regional hospital in Sweden over the course of one year, 2018-2019. Patients who undergo hip fracture surgery will be eligible for inclusion if they meet the following criteria:

A) age 65 years or older; B) classified in the American Society of Anaesthesiologists as ASA I = (healthy) or ASA II = (mild systemic disease) (90) (Figure 3); C) Independent living before the hip fracture; D) the ability to speak and understand Swedish; and E) no cognitive impairment (Pfeiffer-test 8-10) (91).

Procedure

We assume that patients in this study follow the pattern of a 15 percent drop-out at four months, a trend seen in the previous study III in this thesis. For this study, 60 patients will be included. The Registered Nurse (RN) in charge of nursing care in the acute orthopaedic hospital wards will identify potential patients, inform them about the study, and ask them about participation. Measurements that will be used in this study are the NQR *Rikshöft*, including EQ-5D (5 L), the Swedish version of the Falls Efficacy Scale (FES(S)) and Postoperative Recovery Profile (PRP) questionnaire (described in section measurements, study III).

Figure 4. Description of the proposed tasks by professionals in the inter-professional team (three following pages)

Filled in by the **Registered Nurse (RN)/Assistant Nurse (AN)**

Patient	Date: ___/___ 20__
Information given to the patient	<input type="checkbox"/> How the hip fracture can influence on physical, psychological and psychosocial areas <input type="checkbox"/> View an information movie <input type="checkbox"/> Receive information material described at the Swedish National Hip Fracture register homepage <input type="checkbox"/> Osteoporosis information given with the aim to prevent a second fracture
Education given to the patient	<input type="checkbox"/> Using motivational interviewing (MI) to motivate the patient to take control over their mobilisation and rehabilitation (PADL) <input type="checkbox"/> About the expected pathway (10 days) <input type="checkbox"/> Nutrition <input type="checkbox"/> How to prevent complications (see Appendix 3)
Discharge planning, collaboration with inter-professional team	<input type="checkbox"/> Completed Date:..... Signature:
Follow-up, feed-back on patient participation, mobilisation and independency	
Day 1 (Day of operation)	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 2	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 3	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 4	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 5	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 6	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 7	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 8	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 9	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 10	<input type="checkbox"/> Follow-up of patient Date: Sign:

Filled in by the **Physiotherapists (PT)**

Patient	Date: ___/___ 20__
Information given to the patient	<input type="checkbox"/> Individual training programme and exercises with support <input type="checkbox"/> Information on fall prevention
Education given to the patient	<input type="checkbox"/> Together with the patient, set up individual goals for the mobilisation to perform PADL <input type="checkbox"/> Together with the patient, assess the appropriate need for walking-aid
Discharge planning, collaboration with inter-professional team	<input type="checkbox"/> Together with the patient, assess the need for home-care support in connection with discharge
Follow up, feed-back on patient participation, mobilisation and independency	<input type="checkbox"/> Assessment of PADL on day 2-5
Day 1 (Day of operation)	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 2	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 3	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 4	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 5	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 6	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 7	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 8	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 9	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 10	<input type="checkbox"/> Follow-up of patient Date: Sign:

Filled in by the **Occupational therapists (OT)**

Patient	Date: ___ / ___ 20__
Education given to the patient	<input type="checkbox"/> Together with the patient, set up daily individual goals to perform PADL independently <input type="checkbox"/> Together with the patient, assess the need for assistive products and introduce the patient to them
Discharge planning, collaboration with inter-professional team	<input type="checkbox"/> Together with the patient, decide on which assistive products are needed in the home upon discharge
Follow up, feed-back on patient participation, mobilisation and independency	<input type="checkbox"/> Assessment of PADL on day 2-5
Day 1 (Day of operation)	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 2	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 3	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 4	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 5	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 6	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 7	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 8	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 9	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 10	<input type="checkbox"/> Follow-up of patient Date: Sign:

Filled in by the **Orthopaedic surgeons (OS)**

Patient	Date: ___ / ___ 20__
Information given to the patient	<input type="checkbox"/> What type of surgery <input type="checkbox"/> Why the type of surgery technique was chosen
Discharge planning, collaboration with inter-professional team	<input type="checkbox"/> Together with the patient assess the need for pain relief
Follow up, feed-back on patient participation, mobilisation and independency	<input type="checkbox"/> Follow-up indicators for complications
Day 1 (Day of operation)	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 2	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 3	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 10	<input type="checkbox"/> Follow-up of patient Date: Sign:

Filled in by the **Geriatricians (G)**

Patient	Date: ___ / ___ 20__
Education given to the patient	<input type="checkbox"/> Medical issues in the geriatric patient <input type="checkbox"/> Medication/combinations to prevent complications
Follow up, feed-back on patient participation, mobilisation and independency	<input type="checkbox"/> Estimate the patient's need for more in-hospital care (geriatric care)
Day 1 (Day of operation)	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 2	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 3	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 4	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 5	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 6	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 7	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 8	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 9	<input type="checkbox"/> Follow-up of patient Date: Sign:
Day 10	<input type="checkbox"/> Follow-up of patient Date: Sign:

Data analysis

Descriptive statistics as frequencies, percent, mean (SD), and median (Q1-Q3) will be used for both the analysis of the questionnaires and the rates of missing data to explore this issue and to optimise the future full-scale trial (77, 98). The analysis of the feasibility study will be on an intention-to-treat basis (77). Data will be analysed using SPSS version 21.0 (IBM Corp, Armonk, New York).

Ethical approval and considerations

Studies I to III were approved by the Regional Ethical Board in Lund, Sweden (Dnr 2013/320) and were conducted in accordance with the ethical principles for medical research involving human subjects declared by the World Medical Association Declaration of Helsinki (102). The participants received oral and written information about the studies. They were informed that participation was voluntary and that they could withdraw at any time without explanation and without affecting their future care. Autonomy was assured, as was the fact that data would be treated in strictness confidence. Written informed consent was obtained at the hospital before the data was collected in all the three studies. At the interview situations, open-ended questions were used. According to the principles of justice, there may be questions as to why we only included a group of healthy individuals (77). However, the hypothesis is that this study will generate knowledge that can be transferred to a more morbid population that sustains a hip fracture. Furthermore, this study may generate knowledge that can be transferred to the care of people with other diseases. The benefits for participants in this studies include avoiding, preventing, and minimising the risk of harm. The participants could choose how much they wanted to reveal. Although they had already given their written informed consent, all participants were contacted by phone before they were visited at home for the follow-up interview. The questionnaires do not include emotional or sensitive information. All the data included in the interviews and the questionnaires were coded, which ensures confidentiality (93, 94)

Results

The main finding of this thesis is that the sustaining of a hip fracture could have long-lasting consequences. According to the view of these previously healthy, independent-living people 65 years or older, this accident can have a detrimental effect on a person's future life situation. The recovery process is multi-dimensional, consisting of physical, psychological, and psychosocial components lasting from the acute hospital stay until four months. The ward context, i.e. the environment and the ward professionals' behaviour, can influence patients' self-efficacy and ability to perform the same tasks as they could before the hip fracture. After four months, the participants reported different stages of recovery physically, psychologically, and psychosocially. Physical restraints have psychological effects, and psychological restraints have physical effects. This group of patients were heterogeneous in terms of their different perceptions of the consequences of the hip fracture, different thoughts about their ability to recover, and different strategies to regain independence or to give up. They reported different needs at different stages of the recovery process.

Study I

To end up in a new situation with or without control

This was an explorative qualitative study. The main findings were that initially all the patients believed in recovery and thought nothing would be altered. Because of the routines at the acute hospital and because they adapted to the ward culture, they became passive, which influenced their self-confidence in terms of regaining previous function capability. They became aware that the hip fracture could have a detrimental effect and became insecure about their future living situation. The

participants found themselves in a situation that was unfamiliar to them, and they, therefore, felt ill equipped to manage. They were not offered the opportunity to make decisions about their care. The following of the routines at the acute hospital resulted in passivity and slowly impaired the inner belief of patients in terms of their capacity to have a successful recovery. A belief in one's ability and dedication were crucial factors. This was the main category: 'To end up in a new situation with or without control' (Figure 5).

Belief in recovery, nothing would be altered

The sustaining of a hip fracture was seen as an accident that resulted in temporarily declined function. The patients were aware that they might have to accept some temporary impairment. They believed that the limitations posed by the hip fracture would pass within a few weeks and were convinced that this would be the case. The fact that they felt sound in mind and body and pictured themselves as being healthy presupposed their chances for successful recovery. The hip fracture was an unexpected event, and the patients knew that they would require great determination if they were to fully recover from it. The most important driving force they had was the thought of regaining a normal life as soon as was possible.

Adapting to a new situation in the hospital

Because the patients had limited experiences of being hospitalised, they did not know what to expect. They wanted to be able to decide when and how they would perform specific tasks. They wanted to work things out independently as far as was possible. They were told by the hospital staff to be careful because of the risk of falling. They were told to use a walking frame and to not move without assistance. Activities were to be carried out in a timeframe that was convenient for the carers but not necessarily for the patients. To adapt, accept, and follow the routines at the acute hospital resulted in patients feeling uncertain about how to meet the expectations in terms of how they were to manage by themselves in a way that worked with the routines of the hospital. This led to passivity. For them, it was essential that they lived up to the expectations and received praise from people in their surroundings. One point of focus concerned the patients' having the opportunity to manage tasks in their own way at a time that was convenient for them.

To feel that they were improving day by day served to build their self-confidence and helped them cope with the recovery.

An unpredictable future

Patients cherished hope and strived to find the strength required that would allow them to perform everyday tasks upon their return home. Everyday life would be different, to begin with, and this led to a level of uncertainty about how to endure and to retain the fighting spirit that would result in their regaining independence in the future. At the hospital, the patients felt secure in the knowledge that they would receive help if needed. Their two main concerns with returning home were their ability to cope with the pain and their fear of falling again. The hip fracture event was a new experience, and there was an uncertainty about how this would affect their everyday lives in the future. Thoughts about future life concerned doubt, fear, and hope about the ability to find the strength needed so that they could regain previous function capabilities. The strategy for recovery was to improve independence through the gradual performance of tasks.

Sub Categories	Generic Categories	Main Category
No problem, I will manage this		
An unexpected event, determination will be needed	Belief in recovery, nothing will be altered	
Need for appraisal	Adapting to a new situation in the hospital	
Context as a negative influence		
When and how to recover		
Uncertainty	An unpredictable future	To end up in a new situation with or without control

Figure 5. An overview of the generation of sub-categories, generic categories, and the main category

Study II

Hip fracture, an interruption that has consequences for everyday life.

This was an explorative, qualitative, follow-up study. The main finding was that the participants saw their hip fracture as an interruption that would have lasting effects on everyday life four months after they sustained such an injury. At four months, the patients described how they felt confused and irresolute. Thoughts that mattered concerned their personal capability to adjust to this status as a natural part of the ageing process. Their choice was either to accept their new situation or to struggle and work hard towards once again being independent. The physical restraints had psychological effects, and conversely the psychological effects – such as fear of falling and future isolation – influenced their physical recovery. The participants described how they were forced to have patience and to continue striving towards a sense of independence or to prepare to accept personal changes, and to re-evaluate and adapt to a new dependency on others in order to be able to carry out everyday chores. This was the category ‘Hip fracture: an interruption that has consequences for everyday life’.

The hip fracture impinges on physical recovery

At four months, the participants described how the hip fracture still affected them physically. They described how they perceived physical hindrances, such as reduced mobility, reduced leg strength and weakness, poor balance, and sense of fatigue.

Uncertainty in physical activities has psychological effects

The physical constraints resulted in withdrawal from relations and detachment to the usual contexts, and resulted in a shift in their life situation: they became less active socially and more of their activities took place indoors. Activities required thorough planning and therefore spontaneous activities were no longer as appropriate. The fear of falling and the patients’ long-lasting sense of insecurity when it came to walking contrasted with their motivation to regain independence and had an inhibitory effect. Because of a lack of energy, everyday life had resulted in isolation. This suppressed condition threatened their self-determination and thus contributed to loneliness.

Being at a point of decision: to continue fighting for independence or to give up

At four months, the participants were aware that regaining their previous functions would take longer than expected. Failing health meant a decision on the part of the individual as to which degree of recovery should be the goal. Maintaining the sense that recovery was progressing was a challenge. Patients began to feel the importance of considering the essential matters in life, in areas of both higher and lesser importance. The personal inner struggle was between whether to surrender or whether to fight to remain positive. Inner strength and support were lifelines that helped maintain control. Some participants stated how they had lost the ability and inspiration to participate in social activities. One reason as to why some of them had home healthcare or that they were living in a nursing home after four months was the firm conviction not to trouble next of kin.

To generate a strong driving force and determination are the basis for recovery after an operation

Some participants had adjusted their daily activities to a slower rate. Essential to their regaining their self-esteem and self-confidence, they explained, was being able to manage everyday chores on their own at a time they themselves decided on. Different psychological strategies were used with respect to recovery and to coping with the long recovery time. Some participants planned both for the immediate future as well as for the more long-term perspective. Some realised that it was important to do activities that were planned before the hip fracture. These activities often involved next of kin to whom they felt responsibility. These participants were motivated to perform physical activities by way of short-term and long-term goals. Success in regaining previous functions was achieved through performing tasks by themselves (Figure 6).

Sub categories	Category
<p>The hip fracture impinges on physical recovery</p> <p>Uncertainty in physical activities has psychological effects</p> <p>Being at a point of decision: to continue fighting for independence or to give up</p> <p>To generate a strong driving force and determination are the basis for recovery after an operation</p>	<p>Hip fracture, an interruption that has consequences for everyday life</p>

Figure 6. Sub-categories and the category revealed during the analysis

Study III

Patient-reported outcomes at acute hospital stay and four months after hip fracture surgery

This was a register-questionnaire study that consisted both of a patient-reported assessment at the acute hospital, 2-5 days after surgery, and at follow-up four months later, as well as of results from the NQR *Rikshöft*, including EQ-5D. The questionnaires used were FES(S) and PRP.

The NQR *Rikshöft* showed differences in mobility. At baseline (one week before the hip fracture), 93.1 percent of the patients had *walked independently alone outdoors*. This decreased to 70.0 percent (p= 0.011) at the four-month follow-up. The same pattern was detected for the *ability to walk without aids*. At baseline, the proportion was 70.7 percent, which decreased to 53.1 percent (p= 0.012) at the four-month follow-up.

The EQ-5D showed that in four out of five items, there was a difference between baseline and follow-up four months later. At baseline, 63.4 percent of patients reported no problems with *mobility*; this decreased to 26.1 percent at the four-month follow-up (p<0.001). Those who reported no problems with *usual activities*

decreased from 71.8 percent to 48.9 percent ($p<0.001$). Those who had no *pain/discomfort* decreased from 52.1 percent to 39.9 percent ($p<0.001$), and those who had no *anxiety/depression* decreased from 67.6 percent to 55.9 percent ($p<0.001$).

An analysis of the sub-groups showed that patients in the 75-84 age group reported a significant decrease in *mobility* after four months ($p=0.004$). Concerning *usual activities*, there was a significant decrease in the age groups 75-84 ($p<0.001$) and 85-97 ($p=0.007$). For *pain/discomfort*, a significant decrease was seen in the age groups 65-74 and 75-84 ($p=0.05$). Finally, with regards to *anxiety/depression*, a decline could be observed in the age groups 75-84 and 85-97 ($p=0.03$).

The results of the Falls Efficacy Scale(S) showed that at the four-month follow-up, the participants' confidence was highest in the following three items: *getting on and off toilet* (completely confident (n=88, (56.1%)) and partly confident (n=54, (33.4%)); *personal grooming* (completely confident (n=110, (70.1%)) and partly confident, (n=34, (21.6%)); and *getting dressed/undressed* (completely confident (n=70, (46.2%)) and partly confident (n=65, (41.8%)).

After four months, the participants' confidence was lowest in the following three items: *going up-/downstairs* (completely confident (n=38, (24.4%)) and partly confident (n=75, (48.1%)); *light housekeeping* (completely confident (n=47, (30.3%)) and partly confident (n=60, (38.7%)); and *simple shopping* (completely confident (n=48, (31.4%)) and partly confident (n=61, (39.8%)).

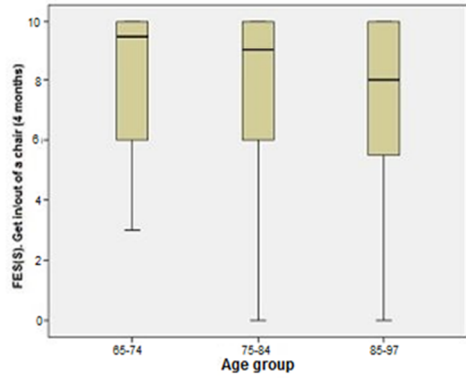
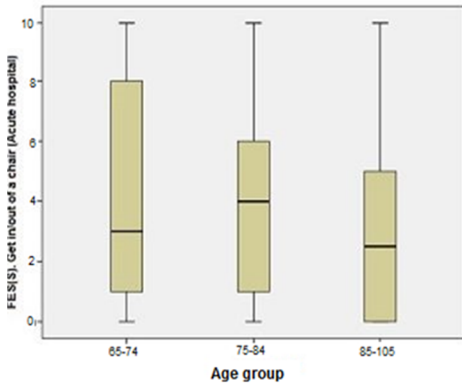
The median at the full summed FES(S) scale at the four-month follow-up was 61.0 (46.2-77.8) with the highest values with activities such as personal grooming, and getting on and off the toilet. In general, participants reported higher confidence in PADL and lower confidence in IADL (Table 8).

Table 8. Median score changes of single items and the sub-scales in the Falls Efficacy Scale(S), at acute hospital 2-5 days after surgery and follow-up at 4 months.

Activity	Median (Q1-Q3)	Acute hospital N=186	Follow-up 4 months N=160	P-value
1. Get in and out of bed	Median (Q1-Q3)	2.0 (.0- 6.0)	9.0 (7.0- 10.0)	.221
2. Get on and off toilet	Median (Q1-Q3)	2.0 (.0- 6.0)	10.0 (7.0- 10.0)	.188
3. Personal grooming	Median (Q1-Q3)	5.0 (2.0- 8.0)	10.0 (9.0- 10.0)	.615
4. Get in/out of a chair	Median (Q1-Q3)	3.0 (1.0- 6.0)	9.0 (6.0- 10.0)	.025
5. Get dressed/undressed	Median (Q1-Q3)	3.0 (1.0- 6.0)	9.0 (7.0- 10.0)	.288
6. Take bath/shower	Median (Q1-Q3)	1.0 (1.0- 5.0)	9.0 (6.3- 10.0)	.333
7. Go up/down stairs	Median (Q1-Q3)	.0 (.0- 3.0)	8.0 (3.3- 9.0)	.716
8. Walk around the block	Median (Q1-Q3)	.0 (.0- 3.0)	8.0 (5.0- 10.0)	.053
9. Reach into cabinets	Median (Q1-Q3)	1.0 (.0- 4.0)	8.0 (4.0- 10.0)	.318
10. Light housekeeping	Median (Q1-Q3)	.0 (.0- 3.0)	8.0 (4.0- 10.0)	.194
11. Prepare meals	Median (Q1-Q3)	1.0 (.0- 5.0)	9.0 (6.0- 10.0)	.224
12. Hurry answer telephone	Median (Q1-Q3)	1.0 (.0- 5.0)	7.0 (4.0- 10.0)	.435
13. Simple shopping	Median (Q1-Q3)	.0 (.0- 3.0)	7.0 (3.5- 10.0)	.052
PADL	Median (Q1-Q3)	19.0 (6.0- 36.0)	55.5 (40.0- 60.0)	.054
IADL	Median (Q1-Q3)	7.0 (1.0- 21.0)	47.0 (26.0- 56.0)	.217
SUM TOTAL	Median (Q1-Q3)	27.0 (9.8- 55.0)	61.0 (46.2- 77.8)	.559

The scale is divided into 2 sub-scales; PADL, personal Activities in Daily Living (items 1-6) and IADL, Instrumental Activities in Daily Living (items 8-13) (maximal possible scores = 60 for each sub-scale). Item 7, (walking up and down stairs) is regarded as an intermediate item.

Get in/out of a chair, acute hospital vs. 4 months



Go up/down stairs, acute hospital vs. 4 months

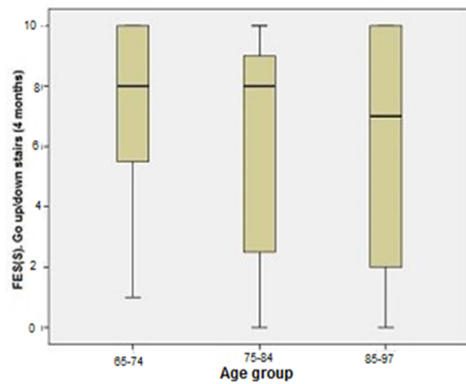
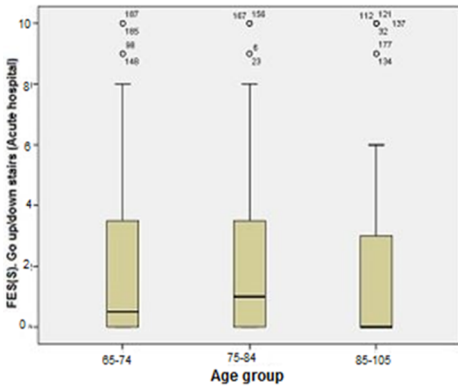
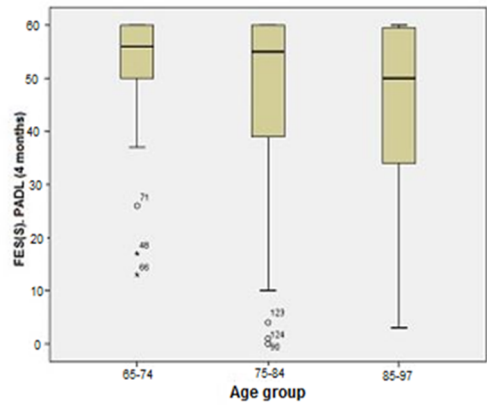
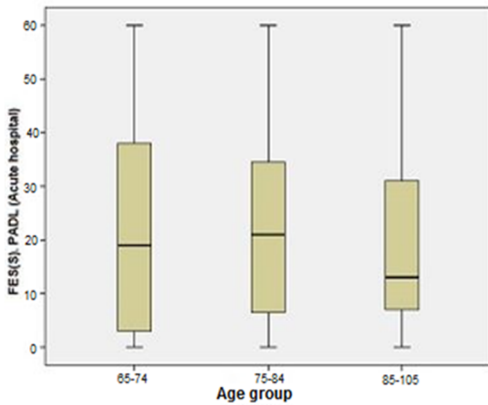
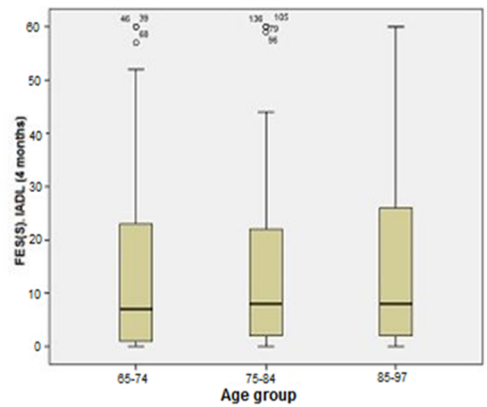
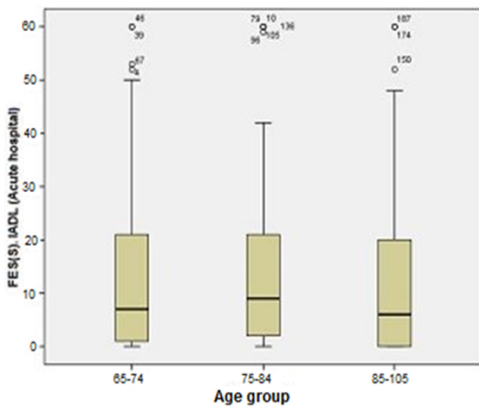


Figure 7. Box-plots showing differences of the items ‘get in/out of a chair’ and ‘go up/down stairs’ (FES(S)) between the acute hospital vs 4 months in different age-groups

Personal activities (PADL), acute hospital vs. 4 months



Instrumental activities (IADL), acute hospital vs. at 4 months



- Represents outliers more than 1,5 box-lengths from the edge of the box
- * Extreme points, extending more than three box-lengths from the edge of the box

Figure 8. Box-plots showing differences of the two sub-scales PADL and IADL (FES(S)) between the acute hospital vs 4 months in different age-groups

The results from the Post Operative Recovery Profile (PRP) questionnaire showed that during the acute hospital stay two to five days after surgery, no patient considered themselves as fully recovered. Concerning their physical symptoms in the acute phase, most problems were reported in the item pain (severe or moderate (n= 137 (73.2%)), with the highest level indicated in the 65-74 age group. Furthermore, the item fatigue was reported as being severe or moderate (n=113 (60.4%)) (Table 9), with the highest level reported in the 75-84 age group. For physical functions in the acute phase, most problems were reported in the item mobilisation dysfunction (severe or moderate n=138 (73.8%)), with the highest levels reported in the 75-84 age group. Muscle weakness was also reported at a high rate (severe or moderate n=113 (61.1%)). In the social part of the questionnaire, the item dependence on help from others was reported as severe or moderate n=127 (69.4%)), with the highest levels reported in the 75-84 age group (Table 9). For the remaining items, there were no differences between the age groups during the acute phase.

Items with restraining influence on recovery at four months were mobilisation dysfunction, muscle weakness, restrictions on social activities, dependence on others, and re-establishing everyday life. The highest level of problems reported in the item mobilisation dysfunction was in the age groups 75-84 and 85-97. In the item muscle weakness, most problems were reported in the age groups 65-74 and 85-97. The most difficulties with social activities were in the age groups 65-74 and 85-97. The most problems with dependence on others were reported in the age group 65-74. The most problems with re-establishing everyday life were reported in the age groups 65-74 and 85-97. Twenty-one percent of patients reported being fully or almost fully recovered at four months at the group level (Table 10). The items showing the most improvement after four months were with pain (mild or none 78.8%), nausea (mild or none 96.2%), fatigue (mild or none 79.4%), appetite change (mild or none 90.0%), and sleeping difficulties (mild or none 81.8%). Further improvements were made in interest in surroundings (mild/none 95.0%) and personal hygiene (mild or none 90.7%).

Table 9. Number and proportion (%) of participants self-reported level of problem in single items at Postoperative Recovery Profile questionnaire, acute hospital 2-5 days after surgery and at follow up at four months

n (%)	At hospital (2-5 days after surgery) N=188				At 4 months N=160			
	Severe	Moderate	Mild	None	Severe	Moderate	Mild	None
Physical symptoms								
Pain	64 (34.2)	73 (39.0)	43 (23.0)	7 (3.7)	5 (3.1)	29 (18.1)	74 (46.3)	52 (32.5)
Nausea	7 (3.7)	32 (17.0)	58 (30.9)	91 (48.4)	0 (0.0)	6 (3.8)	17 (10.6)	137 (85.6)
Fatigue	37 (19.8)	76 (40.6)	61 (32.6)	13 (7.0)	6 (3.8)	27 (16.9)	78 (48.8)	49 (30.6)
Appetite change	22 (11.8)	63 (33.9)	50 (26.9)	51 (27.4)	*	1 (0.6)	27 (17.0)	116 (73.0)
Sleeping difficulties	* 18 (9.6)	73 (39.0)	56 (29.9)	40 (21.4)	*	2 (1.3)	59 (37.1)	71 (44.7)
Physical Functions								
Gastrointestinal function	* 24 (13.0)	47 (25.4)	52 (28.1)	62 (33.5)	7 (4.4)	29 (18.1)	33 (20.6)	91 (56.9)
Bladder function	** 8 (4.4)	27 (14.8)	46 (25.1)	102 (55.7)	5 (3.1)	5 (3.1)	30 (18.8)	120 (75.0)
Mobilisation	* 69 (36.9)	69 (36.9)	35 (18.7)	14 (7.5)	5 (3.1)	38 (23.8)	58 (36.3)	59 (36.9)
Muscle weakness	** 34 (18.4)	79 (42.7)	56 (30.3)	16 (8.5)	*	7 (4.4)	75 (47.2)	32 (20.1)
Sexual function					***	10 (7.6)	17 (13.0)	89 (67.9)
Psychological								
Anxiety and worry	21 (11.2)	43 (22.9)	64 (34.0)	60 (31.9)	1 (0.6)	31 (19.4)	49 (30.6)	79 (49.4)
Feeling down	12 (6.4)	39 (20.7)	59 (31.4)	78 (41.5)	1 (0.6)	27 (17.0)	58 (36.5)	73 (45.9)
Felling lonely/abandoned	12 (6.4)	26 (13.8)	43 (22.9)	107 (56.9)	2 (1.3)	21 (13.1)	33 (20.6)	104 (65.0)
Concentration difficulties	7 (3.8)	32 (17.3)	75 (40.5)	71 (38.4)	0 (0.0)	20 (12.5)	49 (30.6)	91 (56.9)
Social								
Social activities	* 31 (16.7)	56 (30.1)	59 (31.7)	40 (21.5)	5 (3.1)	40 (25.0)	55 (34.4)	60 (37.5)
Dependence on others	* 49 (26.8)	78 (42.6)	40 (21.9)	16 (8.7)	10 (6.3)	43 (26.9)	64 (40.0)	43 (26.9)
Interest in surroundings	* 23 (12.3)	36 (19.3)	42 (22.5)	86 (46.0)	*	7 (4.4)	20 (12.6)	131 (82.4)
Activity								
Re-establish everyday life								
Personal hygiene	28 (14.9)	74 (39.4)	41 (21.8)	45 (23.9)	15 (9.4)	41 (25.6)	70 (43.8)	34 (21.3)

*Missing one participant, **Missing two participants, ***Missing 29 participants

Table 10. Postoperative Recovery Profile (PRP), showing the frequencies of participants', n (%), and the assessed total sum of items scored with “no problem” at four months

Global score Postoperative Recovery Profile at 4 months		Recovery profile n (%)
19	<i>(Fully recovered)</i>	8 (5%)
15-18	<i>(almost fully recovered)</i>	25 (16%)
8-14	<i>(partly recovered)</i>	64 (40%)
7	<i>(slightly recovered)</i>	7 (4%)
<7	<i>(not at all recovered)</i>	56 (35%)

Discussion

Several methodological strengths and limitations need to be considered when evaluating the findings. A strength of this thesis was that the four studies included three different designs (qualitative, quantitative and single case study), where the results complimented each other, thus making it a convergent parallel design with strokes of mixed methods (103). Studies I and II were qualitative in their design, enabling a more open exploration of the research area. Neither a qualitative nor a quantitative approach by itself would adequately address the complexity of the research questions in studies I, II and III. The hub of the research has been a qualitative approach, where the patient's view is central.

The outcome of studies I, II, and III has been used to develop the feasibility study protocol, study IV.

Methodological considerations

Studies I and II employed a qualitative design. The qualitative content analysis represents a systematic organisation and interpretation of the data text derived from individual tape-recorded interviews (93, 94). The research question specifies what to analyse and what to create (93). To ensure all the topics were covered, semi-structured interview guides with open-ended questions were used. The main strengths of the qualitative studies were the enlightening descriptions of the previously healthy patients' experiences in terms of the recovery process after a hip fracture. Because the existing knowledge in this research area was limited, the two qualitative studies were used to question the interpretation of the findings rather than to simply take the theories as a given (77). Convenience sampling was chosen because the data was collected in three different geographical areas of Sweden. It is possible that the findings would have been different had another sampling technique

been used. However, the selected sample is representative of this group characteristic according to gender and age distribution. The interviews yielded rich data and were useful in gaining an understanding of the phenomena even if there is a risk that concepts were missing. A strength was that the manual of the methods were followed thoroughly (93, 94). In the four months follow-up (study II), there were five dropouts: this number should be regarded as low.

To evaluate trustworthiness in qualitative research, credibility, dependability, conformability, authenticity, and transferability need to be considered (77, 104, 105).

Trustworthiness

Transferability refers to the extent to which findings can be transferred to or have applicability in other settings or groups (77, 104, 106). In the two qualitative studies (studies I and II), a clear description of the context was given. A large amount of data was collected in three different hospitals in three different areas of Sweden. As such, the reader can deduce that the findings of these qualitative studies may be applicable in other contexts (77, 104, 106).

In qualitative research, credibility deals with how well categories cover the data. It is essential to carry out the study and describe the analysis process in as much detail as possible when reporting the results (77, 104, 105). In study I, a convenience sample procedure was used. The inclusion criteria were based on the ability to get an understanding of the phenomena “Older patients’ perception of their own capacity to regain pre-fracture functions after hip fracture surgery”. To scrutinise the credibility and authenticity of the findings, i.e. how well the categories covered data, the authors moved back and forth between the interview text, codes, sub-categories, (generic category in study I), and main categories. All the researchers were involved in several dialogues during the analysis process to ensure credibility.

Dependability refers to the stability of conditions and data over time. This means that the findings will be the same if the study were to be replicated with similar participants in a similar context (77, 94). The wealth of interview data allowed for a more than sufficient description of the phenomena. The author of this thesis (BG)

conducted all the interviews. The participants knew the interviewer from the first interview, which may have increased their confidence and resulted in rich narratives.

Conformability and authenticity refer to the objectivity of the researcher. One interviewer conducted all the interviews. For the data collection, semi-structured interview guides with open-ended questions were used both to ensure that all topics were covered and that the interviews covered the same areas. The analysis process was conducted by investigator triangulation: independent coding and analysis by all the researchers. In both studies I and II, saturation was reached because no new subcategories reflecting the aims of the studies could be developed from the texts. With a clear description of the context, selection, and characteristics of the participants, the authors have helped the reader to appraise this study's transferability to similar contexts (77, 94, 104, 105).

Validity and Reliability

In quantitative studies, it is essential to consider the validity and reliability of the results (77, 107).

Extern validity

External validity concerns the extent to which the results can be generalised or extended beyond the sample, settings, and conditions in which the study was carried out (107). The patient-reported findings from study III were reported from previously healthy people, 65 years or older, who had lived independently. The classification by the anaesthesiologists of the ASA grade may differ between the three hospitals. There is a risk of selection bias even if the selected population in this quantitative study is representative of elderly people who sustain a hip fracture. A consecutive data collection was used.

Intern validity

Intern validity refers to the extent to which extraneous factors, such as group differences, may or may not influence the results (77, 107). The questionnaires in this study have previously been validity- and reliability-tested in elderly populations in Sweden (50, 95, 97). The leaders and ward personal at the three hospitals included in this study received information and written instructional material about how and when to recruit patients. At the follow-up at four months, the tendency was that a higher proportion in the oldest age group (85-105) dropped out (57.2%). Maturation is a threat in studies I to III over time. This threat refers to external events or processes that affected participants over the passage of time rather than as a result of the independent variable (77). Examples of such processes in this study could be fatigue, or a physical decline that affected patients psychologically and emotionally. Maturation is a relevant consideration in health research. Maturation does not refer just to ageing but also to any change that occurs over time. For example, maturation in the form of postoperative recovery and other bodily changes could be a confounding explanation for the independent variable's effect on outcome (77).

Construct validity is the judgement concerning whether or not the questionnaires in this study were appropriate for the intended purpose (107, 108).

Euroqol (EQ-5D) is an integral part of the Swedish National Hip Fracture Register. The value of NQR *Rikshöft* and EQ-5D was that these allow for comparison, and consistent, high-quality care in Sweden. All these questionnaires were validity- and reliability-tested on elderly populations in Sweden (PRP after surgery and FES after stroke event). The questionnaires included dimensions of psychological and psychosocial characteristics that together with the findings from studies I and II provide more enhanced results than would the use of only one method (77). Varying the use of contents from an existing measure requires effort in terms of evaluating the psychometric properties, i.e. properties relevant to the study (109).

The questionnaires selected for patient-reported outcomes were Falls Efficacy Scale, Swedish version (FES(S)) and Postoperative Recovery Profile (PRP). The items included were valued as being relevant according to previous research in the area of recovery after hip fracture surgery.

The Falls Efficacy Scale, Swedish version (FES(S)) has been validity- and reliability-tested for patients after stroke in Sweden (50). The Swedish version was developed for self-assessment of the ability of individuals to perform everyday tasks without falling and put more focus on basic, primary activities of daily living (ADL). This makes the scale more suitable for people with moderate to low functional ability compared to the version Falls Efficacy Scale - International (FES-I) (50, 51). After a hip fracture, the fear of falling may affect functional recovery because it hampers participation in exercise during the recovery process (88). The Postoperative Recovery Profile (PRP) questionnaire was tested for validity and reliability with regards to patients after their hip replacement surgery in Sweden (109).

Because this was not an intervention, no power was calculated prior to the study. Descriptive statistics were used for all the analyses. The total sample size was acceptable, and there were no significant differences between the whole group at the acute phase and the follow-up according to age and gender. There were no differences in decreased functions at four months between the age groups compared with before the hip fracture. The p-value was set to the level of significance $p \leq 0.05$.

Reliability

The selection of the three hospitals included in this study represented the most common orthopaedic care culture in Sweden and geographically covered a large part of Sweden. This study included 188 healthy older adults who sustained a hip fracture who were hospitalised at three hospitals in different areas of Sweden. The findings in the two qualitative studies in this thesis (studies I and II) together with the results in study III show the views of patients, their experiences, perceptions, and strategies to recover after hip fracture surgery. Factors have been identified that predict whether patients will recover after hip fracture surgery. An appraisal of these findings shows them to be appropriate in terms of older people after a hip fracture who had previously been healthy and who had lived independently. Study III was reported by following the Statement for Observational Studies (STROBE) (110).

General discussion of the results

The overall aim of this thesis was to garner knowledge about the views of patients, their experiences, perceptions, and strategies for recovery after hip fracture surgery in order to design a feasibility study for an intervention. The results of the studies I, II and II, showed that the recovery process after hip fracture surgery is complicated and can lead to physical, psychological, and psychosocial restraints. Patients suffering from a hip fracture event form a heterogeneous group, and the recovery process differs among them. Integrating the patient's perspective in healthcare decision-making seem essential based on findings from this thesis.

Study I

For previously healthy older adults who lived independently, a hip fracture is a traumatic event that has lasting consequences for everyday life. They went from being convinced of their ability to recover to being uncertain about their ability to regain previous functions and to live independently. This came as a result of adapting to the ward culture at the acute hospital. The category "To end up in a new situation with or without control" indicates that within two to five days after the hip fracture surgery, the patients' desire to regain independence changed to a sense of insecurity about how and if they would recover. Patients' involvement in their ward was limited to the acute hospital stay. Two to five days after surgery, the patients believed in recovery, but they did not receive psychological support. They were expected to perform tasks by themselves but at a time that was convenient for the care providers. However, since they were told that they were to be careful and that they would receive different forms of assistance, they became uncertain about what behaviour they could expect from the carers. While the patients had to adapt to the routines and standard procedures at the hospital, this passivity had a psychological influence, which was reinforced by the hospital staff and relatives. The main goal in rehabilitation after a hip fracture is to identify, develop, and evaluate strategies to optimise recovery so that patients can regain previous functions (88). As soon as possible after surgery, it is important to take advantage of the capabilities of patients so as to maintain their psychological health; if this is not done, there is a risk that

these patients transit into a state described as frail. This syndrome is characterised by diminished strength and endurance, and reduced physical strength. This could increase the vulnerability of the individual, which means that minimal stress can cause functional impairment and increased dependency (33). Older adults value independence very highly. Any lost function that threatens their ability to manage by themselves can have a detrimental effect on their self-confidence and quality of life (111, 112).

Study II

After four months, previously healthy people who sustained a hip fracture described how this had affected them physically, psychologically, and socially. Some had given up hope, some strived to regain independence, and some handled the situation with self-confidence and self-efficacy. They found the long-lasting recovery process complex as it consisted of both physical and psychological demands. The findings in this study are consistent with previous studies that included both healthy and unhealthy individuals and that dealt with the interdependency between physical functions and emotional health, and their effects on everyday life (23, 53, 113). A hip fracture is a temporary condition, which differs from a chronic disease for which there is no cure. However, the impairment that comes with a hip fracture can be long-lasting (84-86, 89). The participants in this study considered it essential that they develop a strong sense of self-determination. Those who had succeeded in making plans for both the near and distant future – preferably with a close friend – demonstrated a stronger self-determination. They wanted to meet the expectations in terms of responsibility that they believed others had of them. A positive attitude along with social and psychological support were crucial elements in the path to recovery. Self-efficacy is a person's own belief in their ability to carry out a specific task or a specific behaviour (114). Some of the participants in this study seemed to lack psychological support. The fundamentals of care include physical, psychosocial, and relational dimensions, and are in accordance with components of person-centred care (69, 115, 116). Findings in this study raise concerns about how the dignity of such patients needs consideration (114), as do their self-confidence and self-determination (53, 64, 111, 112), perceived self-efficacy (114, 117),

perceived self-control (22). Successful collaboration in an inter-professional team with the support of self-confidence and self-efficacy may optimise patients' abilities to regain previous functions and independence after a hip fracture (87). This may provide a framework for person-centred care (69, 70).

Study III

Two to five days after surgery, 45.7 percent of the participants reported managing their personal hygiene. Pain, muscle weakness, and decreased mobility were experienced as being the most difficult challenges. Different age groups reported different challenges. The 65-74 age group reported most difficulties with pain. The 75-84 age group reported most challenges with fatigue, mobilisation dysfunction, and dependence on others. Together, the measurements used in this study indicated a similar pattern at the four-month follow-up. The altered life situation reflects how 93 percent of these previously healthy adults walked alone outside before the hip fracture (N=188): this had declined to 70 percent (N=160) at four months.

At four months, only 21 percent of these patients assessed themselves as being fully recovered. The highest confidence was in performing tasks (without falling) in PADL. Low confidence (low fall-related self-efficacy) was reported in completing IADL and with the single item going up and down stairs. Most reported problems were with pain, muscle weakness, and mobility, even though these dysfunctions differed between the three age groups. The 65-74 age group reported most difficulties with pain, muscle weakness, social activities, and re-establishment of everyday life. The 85-97 age group reported their highest burden as being muscle weakness, mobility, performance of usual activities, re-establishment of daily life, social activities, and anxiety/depression. The most frequently reported difficulties with mobilisation dysfunction occurred in the two oldest age groups.

The group of previously healthy older adults is heterogeneous, and different age groups experienced different challenges both during the acute hospital stay and at the four-month follow-up. Among the risk factors that led to failure to regain previous everyday function, post-fall syndrome and activity avoidance are crucial (118, 119). At four months, 28 percent of the older adults had ceased taking part in

social activities. This result is similar to the findings of the interview study (study II) when the participants described how they had lost the desire to visit friends or to invite people to their home. This condition along with the attempt to regain previous independence threatened their self-determination and contributed further to the sense of loneliness.

There is limited research regarding changes to domestic life, participation in community, and social life after a hip fracture (84). This strain could add a negative spiral physically, psychologically, and socially. Older people are nowadays more likely to be “wealthier and healthier” compared with previous generations (120). In line with the post-fall syndrome and the low confidence in performing tasks in the IADL section of this study, the indication is that the avoidance of social activities could be a sign of the onset of deteriorating functions. Sweden has one of the highest age-adjusted incidence rates of hip fracture in the world. It is estimated that every fifth woman at the age of 80 and every second woman at the age of 90 will have at least one such experience during her lifetime (5, 9). The promotion of patient-valued outcomes for shaping clinical practice and the linking of the experiences of patients with financial incentives could be compatible with the outcomes that the patients value highest: to regain previous function capability and to regain independence after a hip fracture.

Study IV

Previously healthy people 65 years and older should be able to regain previous functions after hip fracture surgery. Although solid research over the last 30 years aimed to evaluate the best practice, there is limited evidence as to how to achieve the best outcome (88). This feasibility study is based on the preclinical work (studies I, II, III). When arriving at the hospital, all patients believed they would recover and thought nothing would change. However, since they felt forced to adapt to the ward culture at the acute hospital, they became insecure about whether or not they would recover. Signs of frailty and emotional aspects were reflected that related to the impairment and the fear of loss of functions that followed this sudden traumatic event (study I). After four months, the after-effects of the hip fracture still affected everyday life. One fifth of the previous healthy older adults assessed themselves as

recovered (study II). Some expectations of the patients in terms of future life had changed. They were well aware that promoting and maintaining the determination to recover was very much up to themselves (study II). Different age groups assessed different physical and emotional strains at different times during the rehabilitation process (study III). Therefore, the components in this intervention are person-centred care with an inter-professional team at the hospital ward. The focus is to improve self-efficacy and self-confidence in regaining previous functions through collaboration between the patient and the care professional. The partnership with the inter-professional team aims to motivate and support patients in their physical activities by planning short-term and long-term goals. Hip fracture recovery depends on physical, psychological, and psychosocial strategies, and the interplay of these factors influence each other (studies I & II, 53). The study setting is an orthopaedic ward at a central hospital in Sweden, and the intervention will contribute to a care model that promotes the ability of patients to regain previous function capability.

Conclusions and clinical implications

The main goal for recovery after a hip fracture is to identify, develop, and evaluate strategies to optimise recovery to previous functions. The rehabilitation of healthy adults has the potential to improve recovery and preserve independence. Based on the studies in this thesis, the following conclusions can be drawn:

When healthy older adults who lived independently sustain a hip fracture, they believed they would regain the ability to function in the everyday. During the acute hospital stay, they had to adapt to the routines at the acute hospital, which meant limited influence on their ward. The patients had to adapt to the routines and standard procedures of the hospital, and this passivity affected them psychologically. They were expected to perform tasks by themselves but at a time that was convenient for the care providers. This led to these patients becoming uncertain about what kind of behaviour was expected of them. The patients' desire to regain independence changed to a sense of uncertainty as to how and whether or not they would recover.

The recovery phase after a hip fracture is multi-factorial, and four months later, the hip fracture was seen as an interruption that still affected everyday life. Physical impairments affected them psychologically, and psychological factors affected them physically. Some of these previously healthy people had given up, some fought for independence, and some coped with the situation by drawing on their sense of confidence and will-power. Those who had adopted passive strategies made no decisions of their own and did not plan for the future. Homecare aides and next-of-kin decided what the participants were capable of and also decided on the schedule for certain activities. Thus, as a result of impaired mobility and psychological restraints, their life situation changed. From the perspective of older adults who had previously lived independently, the most crucial issue in terms of recovery was to generate a strong will and determination.

The group of previously healthy adults who sustain a hip fracture is heterogeneous, and this heterogeneity means that their recovery process will likely differ. Different age groups experience different challenges at different phases of the recovery process. From the patient-reported outcomes at the four-month follow-up, one fifth of the participants reported themselves as being fully or almost fully recovered. At the four-month follow-up, the majority of the participants reported that they had regained their previous ability to perform Personal Activities of Daily Life (PADL). Poorer rates were confidence in performing Instrumental Activities in Daily Living (IADL) even if there were differences in the group. At four months, 28 percent had ceased taking part in social activities, 30 percent had stopped walking alone outdoors, and 35 percent reported difficulties in re-establishing everyday life. Declined mobility resulted in an increased need for walking aids at four months compared with before the hip fracture.

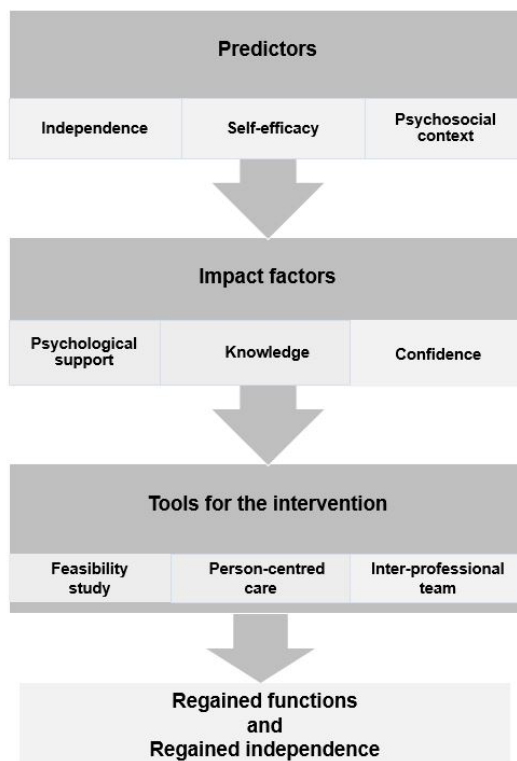


Figure 9. Model of predictors having an impact on recovery after hip fracture surgery

Further research

The findings in this thesis describe how the individual expectations of previously healthy older adults who had lived alone before sustaining a hip fracture are unique. This thesis highlights the need for person-centred care so that older patients retain the inner will to regain their previous function and maintain independence. This is vital if disability in older people, who are not disabled at the time of the hip fracture is to be prevented or delayed.

The findings of the three introductory studies in this thesis indicate that psychological and psychosocial support are important from the time of the hip fracture accident and throughout the rehabilitation period so that patients can regain their pre-fracture function and independence. Findings in this thesis are of clinical importance since the perspectives of the individuals may complement a standardised health professional evaluation. Nursing care and person-centred care may have a mediating role in short- and long-term functional outcomes in hip fracture recovery.

Patients with a hip fracture are commonly studied as a homogeneous group. Three studies in this thesis demonstrate that person-related factors may fill a knowledge gap in elucidating the optimally focused areas to improve recovery and preserve independence. The hospital staff, next-of-kin, and homecare aides need to ensure that the patients maximise their resources as they strive to regain their physical functions. Involving patients in decision-making concerning their care is important socially, ethically, and financially. Bringing patients' issues to the forefront when planning the recovery process after hip fracture surgery increases in importance when patient-valued outcomes are to be promoted. Due to demographic changes in an elderly population, the number of patients sustaining a hip fracture will increase due to osteoporosis. The essence of this thesis was to study the situation that results from the sustaining of a hip fracture from the perspective of the patient. The findings provide a new understanding as to what kind of challenges these patients face.

The development of a feasibility study with person-centred care by an interprofessional team at the acute hospital ward aims to support the requirements an individual has in the recovery from a hip fracture. Findings in the first three studies of this thesis with patient-reported outcomes serve as a complement to

clinical outcomes and can be an important base for future intervention for this group of patients. Patient-reported outcomes (PROM) (46, 121) assessed preoperatively could influence postoperative recovery and could facilitate the patient's preferences for self-management after surgery (86, 122). The feasibility study will serve to refine practice so as to ensure that the care that patients receive is appropriate and suitable, and meets their needs. Together, PROM and patient-reported experience measures (PREM) are essential in the assessment of the quality of care (123). Taking time to listen to the patients' experiences and perception of what happens to them following a hip fracture must be an integral part of healthcare practice and research. The feasibility study will state an intervention with the purpose of enabling replication, evidence synthesis, and broader implementation to other settings and patient groups. Because of the demographic changes with an increased proportion of ageing people, it is crucial to focus on patients who risk early frailty so as to avoid adverse outcomes and so as to place resources on remaining physical independence in older adults (124). The risk of not regaining previous functions after hip fracture surgery is high among older adults who previously lived independently (125). In recent years, research has been conducted for the group of older adults who live independently and their recovery after a hip fracture (126-128).

Svensk sammanfattning

Höftfraktur räknas som en osteoporosfraktur som innebär skörhet i skelettet tillsammans med fall från stående i samma plan. Risken att drabbas av en höftfraktur ökar med stigande ålder ofta på grund av osteoporos (benskörhet) och fall från låg höjd, stående eller sittande (lågenergiskada). Varje år drabbas omkring 18000 personer i Sverige av höftfraktur, andelen kvinnor/män är 70/30 procent och medelålder 82 år (2016).

Det är vanligt att höftfraktur leder till försämrad förmåga att röra sig och detta kan bidra till behov av att få hjälp från andra och försämrad livskvalitet efter frakturen. Många äldre som drabbas har sjukdomar och svårt att röra sig före frakturen. Men data från det svenska kvalitetsregistret RIKSHÖFT visar att 37 procent av patienter med höftfraktur är friska och lever ett liv oberoende av hjälp från andra före frakturen. Dock är det endast 60 procent som återfår sin tidigare funktionsförmåga och kan återgå till vardagen så som det var före frakturen. Psykologiska faktorer och individens egen tro på att återfå funktionsförmågan har visat sig ha betydelse efter en planerad höftoperation. Detta kan också ha betydelse vid återhämtning efter höftfraktur.

Patient-rapporterade utfallsmått (PROM), vad som har betydelse för patienten och patientens upplevelse och nöjdhet med vården är viktigt att ta hänsyn till vid utveckling av vården. Patientperspektivet vad det gäller friska äldre personers upplevelse av hur det är att drabbas av höftfraktur, hur de upplever återhämtningen och sin hälsa efter en höftfraktur är lite utforskat sedan tidigare.

Det övergripande syftet med studierna i denna avhandling är att samla kunskap som speglar patienternas syn, erfarenheter, hanterbarhet och strategier för att återhämta sig efter en höftfrakturoperation och utifrån resultaten av dessa studier designa en feasibility/pilotstudie som är tänkt att genomföras på en ortopedisk vårdavdelning.

De patienter som varit med i de första tre delstudierna var ≥ 65 år, sedan tidigare friska och bodde i eget hem utan att ha någon hjälp från andra.

I det första delarbetet intervjuades 30 patienter på akutsjukhuset 2-5 dagar efter en höftfrakturoperation. De tillfrågades om sin egen uppfattning om sina möjligheter att återhämta sig efter höftfrakturen. Till att börja med trodde alla att de skulle återhämta sig och att livet skulle fortsätta som vanligt även om det kunde ta lite tid. Men på akutsjukhuset måste de anpassa sig till vårdkulturen på vårdavdelningen vilket gjorde att de blev osäkra på hur framtiden skulle bli. Vårdpersonalen sa att de måste akta sig noga, att de måste använda en rollator och att de inte fick gå upp och gå själva. Patienterna blev osäkra på vad som förväntades av dem eftersom de uppmanades att göra saker själva men detta skulle ske vid en tidpunkt som passade personalen.

Det andra delarbetet intervjuades samma personer i sina hem fyra månader efter frakturen. 25 deltog i den intervju som skulle beskriva hur de ansåg att de hade återhämtat sig efter höftfrakturen i olika avseenden. Det visade sig att höftfrakturen fortfarande påverkade vardagen. Sviter efter frakturen påverkade det dagliga livet både fysisk, psykiskt och socialt. Fysiska besvär var försämrad rörlighet, försämrad muskelkraft, försämrad balans och känsla av orkeslöshet. Dessa fysiska handikapp påverkade personerna psykiskt. Rädslan för att falla igen hade gjort att de deltog i färre sociala aktiviteter än tidigare. De beskrev också att de hade färre relationer med goda vänner, mindre utomhusaktiviteter och hade blivit mer isolerade. Många beskrev att de tyckte att återhämtningen tog oväntat lång tid och att det var svårt att motivera sig och att fortsätta att tro på att kunna återgå till tidigare vardag utan att behöva få hjälp från andra. Under intervjuerna beskrev några personer att de hade gett upp och några att de nästan hade återhämtat sig redan. Några personer vacklade och funderade på om de skulle fortsätta kämpa för att kunna leva ett liv utan att behöva få hjälp från andra eller om de skulle ge upp. Några uttryckte att bli beroende av andra var vad man skulle förvänta sig då man blev äldre. Att ha kämpaglöd och bibehålla självkontrollen framhölls vara de egenskaper som avgjorde om man skulle kunna återhämta sig efter en höftfraktur.

Det tredje delarbetet var en register/enkätstudie där 188 patienter fick besvara tre enkäter först på akutsjukhuset och därefter igen efter 4 månader då de tre enkäterna,

EQ-5D, Falls Efficacy Scale, svensk version (FES(S)) samt Postoperative Recovery Profile (PRP) skickades hem till patienten. Syftet med studien var att identifiera faktorer som förutsade möjligheter eller problem under återhämtningen efter höftfrakturen. Data från de flesta patienter, som råkat ut för en höftfraktur i Sverige registreras i det nationella kvalitetsregistret RIKSHÖFT (NQR). Exempel på data är ålder, kön, sjuklighet (ASA), gångförmåga före höftfrakturen, boendeform och om patienten har drabbats av någon komplikation vårdtiden på sjukhus eller inom 4 månader. Frågor i EQ-5D handlar om självskattad hälsorelaterad livskvalitet med frågor om eventuella svårigheter att röra sig, att klara egen personlig hygien, vardagliga aktiviteter, smärta/obehag samt oro/depression. Efter att ha fallit och haft en höftfraktur är det vanligt med rädsla för att falla igen. Detta kan vara orsak till att man slutar göra saker som man vanligen brukar göra. FES(S) användes i denna studie och där förväntas personen svara på sin egen tilltro till att klara vardagliga aktiviteter utan att falla på en skala mellan 0 (inte säker alls) till 10 (helt säker). PRP är enkät med påståenden inom fem områden som fysiska symtom, fysiska funktioner, psykiska symtom, socialt samt om aktiviteter. Exempelvis ”just nu/de senaste 24 timmarna har jag en smärta som är” *svår*, *medelsvår*, *lindrig* eller *ingen* smärta. PRP innehåller 17 påståenden (akut) och 19 påståenden (4 månader). De två påståenden som saknades då enkäten fylldes i på akutsjukhuset var ”påverkan på mitt sexualliv” och ”inskränkning i mitt vardagsliv”. All insamlad data sammanställdes och redovisades med beskrivande statistik. Efter fyra månader svarade 21 procent av personerna att de helt eller nästan helt hade återhämtat sig efter höftfrakturen. Det fanns skillnader mellan olika åldersgrupper vad som skattades som ”inga problem” eller som ”svårt” de två olika undersökningstillfällena.

Det fjärde delarbetet är ett studieprotokoll för en feasibility/ pilotstudie där resultatet från de tre första delarbetena i denna avhandling används som grund. En feasibility studie syftar till att värdera genomförbarheten av en intervention. Den planerade feasibility-studien är tänkt att genomföras på en ortopedisk vårdavdelning i Sverige. Interventionens fokus är personcentrerad vård med samarbete mellan patienten och ett inter-professionellt team för att stödja hjälp till självhjälp med att stegvis återfå tidigare funktionsförmåga.

Sammanfattningsvis visar de tre första delstudierna att patienter 65 år och äldre som drabbats av höftfraktur inte är en homogen grupp. De har olika värderingar, förutsättningar, krav samt olika kortsiktiga och långsiktiga mål under olika faser av återhämtningstiden. Personcentrerad vård innebär att ta hänsyn till enskilda personers individuella styrkor, svagheter och framtidsplaner. Istället för att vara passiv mottagare för att rehabilitera sig till tidigare funktionsförmåga blir personen en aktiv part i vård och beslutsprocess. Detta innebär en dynamisk process från att personen under den akuta fasen vid höftfraktur, operation och det postoperativa förloppet är helt beroende av hjälp med grundläggande behov till att med bibehållen autonomi gradvis återfå tidigare funktionsförmåga. Den beskrivna feasibility-studien (studie IV) med personcentrerad vård innebär att utveckla ett interprofessionellt vårdteam, det vill säga att förändra professionella kulturella mönster på en akut ortopedisk vårdavdelning. Det förändrade arbetssättet innebär att istället för att varje profession agerar som enskild expert interagerar olika professioner med varandra och intar en stödjande roll som kännetecknas av psykologiskt stöd till hjälp till självhjälp. En stödjande vårdprocess där individen blir i centrum och en aktiv deltagare kan leda till trygghet och ökad patienttillfredsställelse.

Eftersom den demografiska utvecklingen i Sverige och Europa utvecklas mot att andelen äldre i samhället ökar är det viktigt att förhindra försämring hos de som tidigare varit friska och levt ett liv oberoende av hjälp från andra. Kunskap att bära med sig från denna avhandling kan ligga till grund för hur vården planeras i framtiden. Att stärka patientens egen tilltro till att kunna återgå till tidigare vardag och att förebygga ytterligare fall och frakturer hos äldre är en stor vinst såväl för den enskilda individen och dennes familj och samhällsekonomiskt.

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Appendix 1

RIKSHÖFT

Primary operation form1

Q2. Patient ID number / . . / . . -

Year, month, day and 4 digit security number

Q4. Side of fracture · **Q7. Sex** · 1= Male 2= Female.

1= left side 2 = right side.

Q14. Type of Fracture · (see figure on the back of this form)

1=Undisplaced cervical fracture 2=Displaced cervical fracture 3= Basocervical fracture 4= Trochanteric two fragments fracture
5= Trochanteric fracture multi fragments 6=Subtrochanteric fracture

Q5. Date of Fracture / . . / . . **Q374. Time of fracture**

Year/ Month/ Day (if it is not known use day of admission) 24 hours clock

Q8. Date of admission / . . / . . **Q139. Time of admission**

Year/ Month/ Day 24 hours clock

Q140 Time of first pain relief **Q141. Time of Xray**

24 hours clock 24 hours clock

Q9. Admitted from: ·

1 Own home 2=Sheltered housing 3= Institutional care 6=Rehabilitation unit 7= Acute hospital 8=Other

Q10. Living alone ·

1=Yes 2=No 3=Institutional care (category 3-7 above).

Q11. Walking ·

1= Walked alone out of doors 2= Walked out of doors only if accompanied 3= Walked alone indoors but not out of doors
4= Walked indoors only if accompanied 5= Unable to walk

Q12. Walking aids ·

1 – Can walk without aids 2= One aid (stick, crutch, tripod or hemiwalker) 3 = Two aids 4=Frame/Rollator 5=Wheelchair/bedbound

Q13. ASA grade · **Q15. Pathological fracture** ·

1-5 Se back on this form 1=No 2=Metastatic fracture.

Q16. Date of operation / . . / . . **Q142. Time**

Year/ Month/ Day 24 hours clock

Q17. Primary operation · . . .

1 Single screw, pin or nail 2= Two screws, pins or nails 3= Three or more screws, pins or nails 4= Single screw, pin or nail with side plate 5= Intramedullary nail 6= Hemiarthroplasty 7= Total hip arthroplasty 8= Conservative 9= Other (For more detailed se back on this form)

Q18. Date of Discharge or death from admission ward / . . / . . Year/ Month/ Day

Q19. Discharged to ·

1 Own home 2=Sheltered housing 3= Institutional care 6=Rehabilitation unit 7= Acute hospital 8=Other 9=Deceased

At admission During hospital At discharge

Occurrence of pressure ulcers on buttock or sacrum **Q144.** · **Q120.** · **Q163.** ·

Occurrence of pressure ulcer on heel **Q145.** · **Q121.** · **Q164.** ·

Occurrence of pressure ulcer any other area **Q146.** · **Q122.** · **Q165.** ·

Q166 Is a validated risk assessment scale used? · 1=Yes 2= No

At admission

Q153. On Warfarin · 1=Yes 2=No

Q154. Kognitive status · 1= Normal mental functioning 2= Suspect dementia/delirium 3=Dementia diagnose

Q147. Kognitive screening SPMSQ · · (see on the back of this form)

During hospitalization

Q127. Superficial woid infection · 1=Yes 2=No **Q378. Length**cm

Q128. Deep wound infection · 1=Yes 2=No **Q 379. Weight**kg

Q 380 .BMI · . ,

Own Questions (only analyzed by the own clinic)

Q148. · · **Q149.** · · **Q150.** · · **Q151.** · · **Q152.** · · **Q375.** · · **Q376.** · · **Q377.** · ·

Q158. / . . / . . (Year/ Month/ Day) **Q159.** / . . / . . (Year/ Month/ Day)

Q160. / . . . / . . . (Year/ Month/ Day) **Q162.** / . . . / . . . (Year/ Month/ Day)

Q371. (24 hours clock)

RIKSHÖFT Primary operation Form 1

Codes for ASA classification

1. A Completely fit and healthy person who is on no medication and has no medical illness (other than the hip fracture). They obviously may have had medical problems in the past but these are now resolved.
2. The patient has some illness but this has no effect on normal daily activity and the patient has no symptoms related to this condition. Examples of this are things such as hypertension on treatment.
3. These are patients who suffer from conditions such as diabetes mellitus, asthma, angina, respiratory diseases. Providing however these conditions can be described as mild to moderate and only result in minimal symptoms with little restriction on the patients lifestyle.
4. This is more symptomatic illness causing everyday and severe restriction on the patients' life style. Examples of such conditions are severe chronic bronchitis, unstable diabetes, frequent angina.
5. Moribund. The patient is in such a poor physical state that he/she is not expected to live more than a few days.

Additional codes for Primary operation

- 2.10 Two screws (Type unspecified)
- 2.11 Two Cancellous threaded screws (e.g. AO, Asnis)
- 2.12 Two Hansson pins
- 2.14 Two Olmed screws
- 3.10 Three screws (Type unspecified)
- 4.10 Telescoping implant (Type unspecified)
- 4.12 Sliding hip screw with trochanteric side plate
- 4.13 Sliding hip screw with Medoff side plate
- 5.10 Short intramedullary nail (Type unspecified)
- 5.11 Short Gamma nail
- 5.20 Long intramedullary nail (Type unspecified)
- 5.21 Long Gamma nail
- 6.10 Unipolar hemiarthroplasty (Type unspecified)
- 6.20 Bipolar hemiarthroplasty (Type unspecified)
- 7.10 Total hip replacement (Type unspecified)
- 8.10 Conservative treatment (indication or method not specified)

Codes for Pressure ulcer classification

0= None

- 1.= Non blanching erythema of intact skin.
- 2= Partial thickness skin loss. The skin surface is broken resulting in an abrasion or crater.
- 3= Full thickness skin loss and extension into subcutaneous fat but not through underlying fascia.
- 4= Extensive destruction involving damage to muscle, bone or tendon.

Pfeiffer test Short portable mental status questionnaire (SPMSQ)

Scores below 7 (max = 10) are generally considered to be indicative of impaired mental function. This test should be administered to the patient on admission to the acute orthopaedic ward, if possible prior to operative procedure.

1. What is the date today?
2. What day of the week is it?
3. What is the name of this place?
4. What is your street address?
5. How old are you?
6. When were you born?
7. Who is the prime minister in Sweden now?
8. Who was the prime minister before him/her?
9. What was your mother's maiden name?
10. Count backwards 20-1, (score 1 if no mistakes or subject corrects themselves spontaneously).

Appendix 2

RIKSHÖFT EQ-5D (3L) Primary operation and 4 months follow-up

Q2. Patient ID number / . . /

Year, month, day and 4 digit security number

Q4. Side of fracture · **Q7. Sex** · 1= Male 2= Female.

1= left side 2 = right side.

Q14. Type of Fracture · (see figure on the back of this form)

1=Undisplaced cervical fracture 2=Displaced cervical fracture 3= Basocervical fracture 4= Trochanteric two fragments fracture
5= Trochanteric fracture multi fragments 6=Subtrochanteric fracture

Under each heading, please tick the **ONE** box that describes your health **Today**

MOBILITY

I have no problems in walking about

I have some problems in walking about

I am unable to walk about

SELFCARE

I have no problems washing or dressing myself

I have moderate problems washing or dressing myself

I am unable to wash or dress myself

USUAL ACTIVITIES (e.g. work, study, housework, family or leisure activities)

I have no problems doing my usual activities

I have moderate problems doing my usual activities

I am unable to do my usual activities

PAIN/DISCOMFORT

I have no pain or discomfort

I have moderate pain or discomfort

I have extreme pain or discomfort

ANXIETY / DEPRESSION

I am not anxious or depressed

I am moderate anxious or depressed

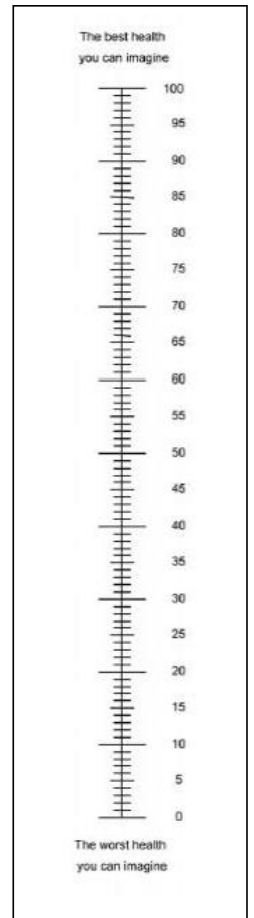
I am extremely anxious or depressed

We would like to know how good or bad your health is **TODAY**

RIKSHÖFT Primary operation EQ-5D

The scale is numbered from 0-100, 100 means the best health you can imagine and 0 the worse health you can imagine. Mark an x on the scale to indicate how your health is **today**

Please write the number in the box below



Appendix 3**RIKSHÖFT****Primary operation Qreg form****Q2. Patient ID number** -

Year, month, day and 4 digit security number

Q4. Side of fracture

1= left side 2 = right side.

Q7. Sex 1= Male 2= Female.**Q14. Type of Fracture** (see figure on the back of this form)

1=Undisplaced cervical fracture 2=Displaced cervical fracture 3= Basocervical fracture 4= Trochanteric two fragments fracture 5= Trochanteric fracture multi fragments 6=Subtrochanteric fracture

Q 147. Pfeiffer test Short portable mental status questionnaire (SPMSQ)

Scores below 7 (max = 10) are generally considered to be indicative of impaired mental function. This test should be administered to the patient on admission to the acute orthopaedic ward, if possible prior to operative procedure.

1. What is the date today?
2. What day of the week is it?
3. What is the name of this place?
4. What is your street address?
5. How old are you?
6. When were you born?
7. Who is the prime minister in Sweden now? 8. Who was the prime minister before him/her
9. What was your mother's maiden name?
10. Count backwards 20-1. (score 1 if no mistakes or subject corrects themselves spontaneously).

Q 80. Place of fall

Where did the patient fall - either within their own residence, outdoors, in another establishment, in a hospital environment, outdoors e.g. in street or the fracture was not caused by a fall.

1. At own home 2. Indoors but not own home or hospital 3. Hospital
4. Outdoors 5. No fall (a spontaneous fracture which occurred without injury)

Q 81. Other coexistent fractures

Did the patient have any other coexisting fracture(s)

1. Upper limb fracture 2. Additional lower limb fracture 3. Other upper and lower limb fractures
4. Other fracture not of limbs 5. Fracture of limb(s) and other areas of body

Q 86. Delay to operation , , , (you can indicate up to 3 reasons)

If the patient waited more than 24 hours from the time the fracture was diagnosed to having their operation,

- 1.0 No delay (i.e. operation within 24 hours of fracture).
- 2.0 Prior to admission to orthopaedic ward
- 3.0 To establish/confirm the diagnosis (specify or classify as below 3.1-3.4)
- 3.1 Diagnosis confirmed by later review
- 3.2 Diagnosis confirmed by repeat x-rays
- 3.3 Diagnosis confirmed by bone scan available.
- 3.4 Diagnosis confirmed by CT scan
- 3.9 Other method of confirming diagnosis (specify)
- 6.0 Operation delayed as patient was medically unfit
- 6.2 Diabetes mellitus to stabilize
- 6.4 Rehydration
- 6.6 Congestive cardiac failure (Treatment of)
- 6.8 Gastrointestinal bleed
- 7.0 To assess medical state
- 7.2 On anticoagulation
- 4.0 Administrative delay (specify)
- 4.1 Lack of hospital bed on orthopaedic ward
- 4.2 Lack of available theatre space
- 4.3 No surgeon available
- 4.4 No anaesthetist
- 4.9 Other cause of delay (specify)
- 5.0 The fracture was initially treated conservatively
- 6.1 Electrolyte imbalance
- 6.3 Chest condition (Treatment of)
- 6.5 Transfusion for anaemia
- 6.7 Cardiac arrhythmia (Treatment of)
- 6.9 Other (specify)
- 7.1 Myocardial infarction
- 8.0 No reason apparent

Incidence of complications 1= Yes 2= No**Q123.** **Chest infection** (signs in chest and antibiotics treatment)**Q125.** **Deep vein thrombosis** (ultrasound or venography diagnosis)**Q127.** **Superficial wound infection** (redness of the wound requiring antibiotics)**Q129** **Wound haematoma** (requiring drainage)**Q131.** **Urine infection** (confirmed by culture)**Q133.** **Gastrointestinal haemorrhage** (Haematemesis or maelena)clinical features) **Q135.** **Cerebrovascular accident** (diagnosed clinically)**Q124.** **Cardiac failure** (necessitating treatment)**Q126.** **Pulmonary embolism** (lung scan angiography)**Q128.** **Deep Wound infection****Q130.** **Urine retention** (necessitating catheterisation)**Q132.** **Acute renal failure** (doubling of serum urea or creatine)**Q134.** **Myocardial infarction** (changes on ECG and**Q136.** **Other** **Q157.** **Delirium****Q 143. Patient treated at** 1= Orthopaedic department 2= Geriatric department 3= Medical department 4= Other

Q2. Patient ID number · · · · / · · · / · · · · · · · ·

Year, month, day and 4 digit security number

Q4. Side of fracture · **Q7. Sex** · 1= Male 2= Female.

1= left side 2 = right side.

Q14. Type of Fracture · (see figure on the back of this form)1=Undisplaced cervical fracture 2=Displaced cervical fracture 3= Basocervical fracture 4= Trochanteric two fragments fracture
5= Trochanteric fracture multi fragments 6=Subtrochanteric fracture**Q20. Date of assessment** · · · · / · · / · ·

Year/ Month/ Day

Q 21. Assessment done by ·1= Face to face interview with patient 2= Face to face interview with carer/relative/friend 3= Phone to patient 4= Phone to carer/
relative/ friend 5= Postal questionnaire completed by patient 6= Postal questionnaire completed by carer / relative 7 friend 7= Other**Q22. Residential status** ·

1=Own home 2=Sheltered housing 3= Institutional care 6=Rehabilitation unit 7= Acute hospital 8=Other

Q23. Locomotor ability · (refers to the patients normal walking ability at 4 months after the fracture occurred)1= Walks alone out of doors 2= Walks out of doors only if accompanied 3= Walks alone indoors but not out of doors
4= Walks indoors only if accompanied 5= Unable to walk**Q 24. Walking aids** · (normally used at 4 months after the fracture occurred)

1 – Can walk without aids 2= One aid (stick, crutch tripod or hemiwalker) 3 = Two aids 4=Frame/Rollator 5=Wheelchair/bedbound

Q 25. Pain at the hip ·1= The pain in my hip is severe and spontaneous. I experience it even when I am not moving.
2= The pain in my hip is severe when I attempt to walk and prevents all activity.
3= The pain in my hip is tolerable, permitting limited activity.
4= The pain in my hip occurs only after some activity and disappears quickly with rest.
5= The pain in my hip is slight or intermittent. I experience pain when starting to walk but the pain gets less with normal activity.
6= I experience no pain in my hip 7= Unable to answer.**Q 370. Still on pain relief medication because of the fracture** · 1= Yes 2= No**Q26. Type of stay / readmissions**For type of stay use options in Q 22. for days, give number of days at each residential category from the time of discharge from
primary admission up to 120 days from fracture. For reason, use the following codes1= Surgical complication requiring re-operation
2= Surgical complication not requiring re-operation
3= Medical complication related to the fracture
4= Failure to manage at place of origin due to hip fracture
5= Admitted for reasons not related to the hip fracture
6= Return to place of origin
7= Unknown/not stated

1: Type · days · · · and reason · 5: Type · days · · · and reason ·

2: Type · days · · · and reason · 6: Type · days · · · and reason ·

3: Type · days · · · and reason · 7: Type · days · · · and reason ·

4: Type · days · · · and reason · 8: Type · days · · · and reason ·

Q27. Death · · · · / · · / · · (if death within 4 month of fracture)

Year/ Month/ Day

Own Questions (only analyzed by the own clinic)**Q 372.** **Q373.**

Q2. Patient ID number · · · · / · · · / · · · · · · · ·

Year, month, day and 4 digit security number

Q4. Side of fracture · **Q7. Sex** · 1= Male 2= Female.

1= left side 2 = right side.

Q14. Type of Fracture · (see figure on the back of this form)

1=Undisplaced cervical fracture 2=Displaced cervical fracture 3= Basocervical fracture 4= Trochanteric two fragments fracture
5= Trochanteric fracture multi fragments 6=Subtrochanteric fracture

Incidence of complications 1= Yes 2= No

Q123. · **Chest infection** (signs in chest and antibiotics treatment)

Q124. · **Cardiac failure** (necessitating treatment)

Q125. · **Deep vein thrombosis** (ultrasound or venography diagnosis)

Q126. · **Pulmonary embolism** (lung scan or angiography)

Q127. · **Superficial wound infection** (redness of the wound requiring antibiotics)

Q128. · **Deep Wound infection**

Q129. · **Wound haematoma** (requiring drainage)

Q130. · **Urine retention** (necessitating catheterization)

Q131. · **Urine infection** (confirmed by culture)

Q132. · **Acute renal failure** (doubling of serum urea or creatine)

Q133. · **Gastrointestinal haemorrhage** (Haematemesis or maelena)

Q134. · **Myocardial infarction** (changes on ECG and clinical features)

Q135. · **Cerebrovascular accident** (diagnosed clinically)

Q136. · **Other**

Q157. · **Delirium**

Appendix 6 RIKSHÖFT Primary operation and 4 months follow-up EQ-5D (5L)

Q2. Patient ID number / . . . / . . . -

Year, month, day and 4 digit security number

Q4. Side of fracture · **Q7. Sex** · 1= Male 2= Female.

1= left side 2 = right side.

Q14. Type of Fracture · (see figure on the back of this form)

1=Undisplaced cervical fracture 2=Displaced cervical fracture 3= Basocervical fracture 4= Trochanteric two fragments fracture
5= Trochanteric fracture multi fragments 6=Subtrochanteric fracture

Under each heading, please tick the **ONE** box that describes your health **Today**

MOBILITY

- I have no problems in walking about
- I have slight problems in walking about
- I have moderate problems in walking about
- I have severe problems in walking about
- I am unable to walk about

SELFCARE

- I have no problems washing or dressing myself
- I have slight problems washing or dressing myself
- I have moderate problems washing or dressing myself
- I have severe problems washing or dressing myself
- I am unable to wash or dress myself

USAUAL ACTIVITIES (e.g. work, study, housework, family or leisure activities)

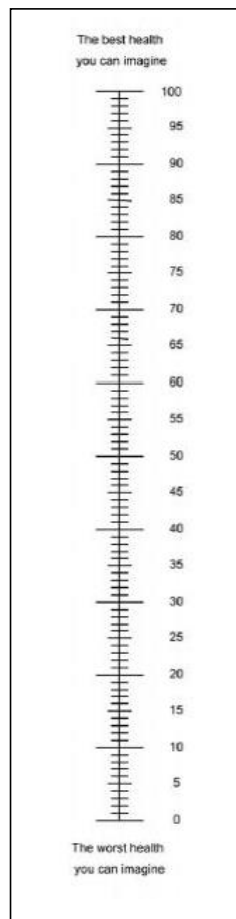
- I have no problems doing my usual activities
- I have slight problems doing my usual activities
- I have moderate problems doing my usual activities
- I have severe problems doing my usual activities
- I am unable to do my usual activities

PAIN/DISCOMFORT

- I have no pain or discomfort
- I have slight pain or discomfort
- I have moderate pain or discomfort
- I have severe pain or discomfort
- I have extreme pain or discomfort

ANXIETY / DEPRESSION

- I am not anxious or depressed
 - I am slightly anxious or depressed
 - I am moderate anxious or depressed
 - I am severely anxious or depressed
 - I am extremely anxious or depressed
- We would like to know how good or bad your health is **TODAY**



RIKSHÖFT 4 Month follow-up EQ-5D

The scale is numbered from 0-100, 100 means the best health you can imagine and 0 the worse health you can imagine. Mark an x on the scale to indicate how your health is **today**

Please write the number in the box below

Appendix 7

Falls Efficacy Scale, Swedish version (FES(S))

On a scale from 0 to 10 with zero meaning not confident at all, 5 being fairly confident, and 10 being completely confident, how confident are you that you can do each of the following activities without falling.

Instructions to Falls-Efficacy Scale, Swedish version (FES(S)): Repeat for each activity: **How confident/sure are you that you can... (as activity below)...without falling?**

Not Confident at all					Fairly confident					Completely confident
1. Get in and out of the bed										
0	1	2	3	4	5	6	7	8	9	10
2. Get onto and off the toilet										
0	1	2	3	4	5	6	7	8	9	10
3. Personal grooming										
0	1	2	3	4	5	6	7	8	9	10
4. Get in and out of a chair										
0	1	2	3	4	5	6	7	8	9	10
5. Get dressed and undressed										
0	1	2	3	4	5	6	7	8	9	10
6. Take a bath or a shower										
0	1	2	3	4	5	6	7	8	9	10
7. Go up and down stairs										
0	1	2	3	4	5	6	7	8	9	10
8. Walk around the neighbourhood										
0	1	2	3	4	5	6	7	8	9	10
9. Reach into cabinets or closets										
0	1	2	3	4	5	6	7	8	9	10
10. Clean house (e.g. sweep or dust)										
0	1	2	3	4	5	6	7	8	9	10
11. Prepare simple meals (not involving carrying hot or heavy objects)										
0	1	2	3	4	5	6	7	8	9	10
12. Hurry to answer the telephone										
0	1	2	3	4	5	6	7	8	9	10
13. Simple shopping										
0	1	2	3	4	5	6	7	8	9	10

The Falls-Efficacy Scale (FES) designed by M E Tinetti, MD. Connecticut. USA. After permission from Dr Tinetti translated and revised by Karin Hellström, Uppsala University, Department of Neuroscience, Physiotherapy. The points on each item are summed to give a possible total score of 130 for FES(S) Total, 60 points for FES(S) PADL (item 1-6) and 60 points for FES(S) IADL (item 8-13)

Date:

Admission: FES(S) total _____ FES(S) PADL _____ FES(S) IADL _____

Follow-up: ES(S) total _____ FES(S) PADL _____ FES(S) IADL _____

Discharge: FES(S) total _____ FES(S) PADL _____ FES(S) IADL _____

Appendix 8

Postoperative Recovery Profile (PRP) questionnaire, acute

Below is a series of questions. Read through them carefully, and put a cross in front of the response that best fits with what you have experienced after your operation.

Right now, I experience.....which is:

1. Pain

No Slight Moderate Severe

2. Nausea

No Slight Moderate Severe

3. Fatigue

No Slight Moderate Severe

4. Change in appetite

No Slight Moderate Severe

5. Difficulty sleeping

No Slight Moderate Severe

6. Gastrointestinal problem (e.g., diarrhea, constipation)

No Slight Moderate Severe

7. Poor bladder function

No Slight Moderate Severe

8. Muscle weakness

No Slight Moderate Severe

9. Immobilisation

No Slight Moderate Severe

10. Anxiety and worry

No Slight Moderate Severe

11. Feeling down

No Slight Moderate Severe

12. Feeling /lonely/abandoned

No Slight Moderate Severe

13. Difficulty in concentration

No Slight Moderate Severe

14. Decreased social activities

No Slight Moderate Severe

15. Dependence on others

No Slight Moderate Severe

16. Decreased interest in surroundings

No Slight Moderate Severe

17. Poor personal hygiene

No Slight Moderate Severe

Appendix 9 Postoperative Recovery Profile (PRP) questionnaire, 4 months follow-up

Below is a series of questions. Read them carefully, and put a cross in front of the response that best fits with what you have experienced after your operation.

During the last 24 hours, I have experienced.....which is:

1. Pain	<input type="checkbox"/> No	<input type="checkbox"/> Slight	<input type="checkbox"/> Moderate	<input type="checkbox"/> Severe
2. Nausea	<input type="checkbox"/> No	<input type="checkbox"/> Slight	<input type="checkbox"/> Moderate	<input type="checkbox"/> Severe
3. Fatigue	<input type="checkbox"/> No	<input type="checkbox"/> Slight	<input type="checkbox"/> Moderate	<input type="checkbox"/> Severe
4. Change in appetite	<input type="checkbox"/> No	<input type="checkbox"/> Slight	<input type="checkbox"/> Moderate	<input type="checkbox"/> Severe
5. Difficulty sleeping	<input type="checkbox"/> No	<input type="checkbox"/> Slight	<input type="checkbox"/> Moderate	<input type="checkbox"/> Severe
6. Gastrointestinal problem (e.g., diarrhea, constipation)	<input type="checkbox"/> No	<input type="checkbox"/> Slight	<input type="checkbox"/> Moderate	<input type="checkbox"/> Severe
7. Poor bladder function	<input type="checkbox"/> No	<input type="checkbox"/> Slight	<input type="checkbox"/> Moderate	<input type="checkbox"/> Severe
8. Muscle weakness	<input type="checkbox"/> No	<input type="checkbox"/> Slight	<input type="checkbox"/> Moderate	<input type="checkbox"/> Severe
9. Impaired sexual activity	<input type="checkbox"/> No	<input type="checkbox"/> Slight	<input type="checkbox"/> Moderate	<input type="checkbox"/> Severe
10. Immobilisation	<input type="checkbox"/> No	<input type="checkbox"/> Slight	<input type="checkbox"/> Moderate	<input type="checkbox"/> Severe
11. Anxiety and worry	<input type="checkbox"/> No	<input type="checkbox"/> Slight	<input type="checkbox"/> Moderate	<input type="checkbox"/> Severe
12. Feeling down	<input type="checkbox"/> No	<input type="checkbox"/> Slight	<input type="checkbox"/> Moderate	<input type="checkbox"/> Severe
13. Feeling /lonely/abandoned	<input type="checkbox"/> No	<input type="checkbox"/> Slight	<input type="checkbox"/> Moderate	<input type="checkbox"/> Severe
14. Difficulty in concentration	<input type="checkbox"/> No	<input type="checkbox"/> Slight	<input type="checkbox"/> Moderate	<input type="checkbox"/> Severe
15. Decreased social activities	<input type="checkbox"/> No	<input type="checkbox"/> Slight	<input type="checkbox"/> Moderate	<input type="checkbox"/> Severe
16. Dependence on others	<input type="checkbox"/> No	<input type="checkbox"/> Slight	<input type="checkbox"/> Moderate	<input type="checkbox"/> Severe
17. Decreased interest in surroundings	<input type="checkbox"/> No	<input type="checkbox"/> Slight	<input type="checkbox"/> Moderate	<input type="checkbox"/> Severe
18. Restriction in my everyday life	<input type="checkbox"/> No	<input type="checkbox"/> Slight	<input type="checkbox"/> Moderate	<input type="checkbox"/> Severe
19. Poor personal hygiene	<input type="checkbox"/> No	<input type="checkbox"/> Slight	<input type="checkbox"/> Moderate	<input type="checkbox"/> Severe

Postoperative Recovery Profile (PRP), R Allvin

Paper I





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Older patients' perception of their own capacity to regain pre-fracture function after hip fracture surgery – an explorative qualitative study

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KEYWORDS

Acute care;
Content analysis;
Healthy patients;
Hip fracture;
Hospital care;
Patient-centred care;
Patient experiences

Abstract *Aims and objectives:* To explore healthy older patients' perceptions of their own capacity to regain pre-fracture function in the acute phase following hip fracture surgery.

Background: The incidence of hip fractures is expected to increase. In Sweden, of the patients who sustain a hip fracture, 40 per cent are healthy and lived independently pre fracture. However, a hip fracture often results in declined functional outcomes for 40 per cent of these patients.

Design: The study had an explorative inductive qualitative design.

Methods: Semi-structured interviews (n = 30) were conducted two to five days after hip fracture surgery. Data were analysed using manifest inductive content analysis.

Results: As a description of patients' perception of their own capacity to regain pre-fracture function after a hip fracture, one main category emerged: To end up in a new situation with or without control. Patients expressed that they believed in recovery and thought nothing would be altered. However, since they had to adapt to the ward culture at the acute hospital, they became passive and became insecure about their future life situation.

Conclusion: The attitudes of staff at the acute hospital can influence the outcome for hip fracture patients. Patients believe in recovery but do not receive psychological support to regain physical capacity.

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Editor comments

This paper describes research that considers the patient's experience and perception of what occurs to him/her following an orthopaedic injury. As nurses, we often have strong sense that we know the needs of our patients and therefore know what they need or prefer. While this may be true, conducting this type of research is vital in either supporting our beliefs or acting as a catalyst for refining our practice to ensure that the care our patients receive is appropriate, suitable and is meeting their needs. Taking time to listen to the 'voice' of our patients must be an integral part of our ongoing practice and research.

PM

Introduction

The number of individuals reaching old age is predicted to increase dramatically over the next decade. It is estimated that the worldwide incidence of hip fracture will rise from the current 1.66 million (in 1990) to 6.26 million in 2050 (Melton, 1993). In Sweden the annual incidence of hip fracture is nearly 18,000. Many older patients with a hip fracture are frail, have chronic disorders and are functionally impaired even before sustaining a fracture. However, data from the Swedish hip fracture register show that 40 per cent of older patients are previously healthy, but after a hip fracture only 40 per cent of these patients regain their earlier functional capacity (Hommel, 2007). The aim of this study was to explore healthy older patients' perceptions of their own capacity to regain pre-fracture function in the acute phase (the first two to five days) after hip fracture surgery.

Background

Hip fractures following a fall are amongst the most devastating consequences of osteoporosis. The lifetime risk of being affected by an osteoporotic fracture ranges from 40 to 50 per cent in women and 13 per cent in men (Johnell and Kanis, 2006). A hip fracture is a sudden, traumatic event that threatens many aspects of life, including physical aspects in the form of a decline in physical functions and increased dependence on others (Magaziner et al., 2000). Psychological aspects include existential thoughts and a reevaluation of their life situation, as well as influencing social relationships (Ziden et al., 2008). As the population ages, the care provided in order to maintain a patient's health status is vital because frailty following surgery can hinder the recovery process (Partridge et al., 2012). Older adults are aware of their vulnerability and know that their life situation can suddenly change. They also have a strong inner driving force to maintain their health (Fange and Ivanoff, 2009). Older patients are espe-

cially vulnerable to loss of dignity during acute hospital admission because impaired health results in loss of functions and a greater physical dependency. Staff behaviour and patient factors also affect patients' dignity (Baillie, 2009).

It is now more than ten years since fast-track pathway for patients with suspected hip fracture was implemented in Sweden. This routine includes steps such as giving patients with a suspected hip fracture intravenous fluids and pain relief in the ambulance and transiting the patient rapidly from the ambulance to the orthopaedic ward directly after radiography. Fast-track care for hip fracture patients can minimise complications, increase priorities and decrease length of stay (LOS) (Hommel et al., 2008; Larsson and Holgers, 2011; Leigheb et al., 2013). Surgery within 24 hours following fracture reduces hospital stay and may also reduce complications and mortality (Al-Ani et al., 2008; Simunovic et al., 2010).

The recovery process after a hip fracture consists of both physical and psychosocial care. Previous research has tended to focus on physical function, which includes post-hospital discharge rehabilitation. Interventions relating to physical function showed no differences in improved mobility at 12 months (Handoll et al., 2011). Other frequently used outcomes are in-hospital mortality, length of stay, time to surgery and complication rate (Liem et al., 2014). There is insufficient evidence relating to the social and psychosocial factors influencing recovery from a hip fracture. Further research in this area is required which should include patient-reported outcomes to identify essential factors in hip fracture care (Crotty et al., 2010). Factors associated with a reduced level of mobility after hip fracture surgery are affected by psychological factors (fear of falling, lack of confidence, frustration and feeling lazy), physical factors (fatigue, pain, balance, weakness, co-morbidities) and social and environmental factors (reliance on next of kin, changed living arrangements). Patients receiving inpatient rehabilitation were very optimistic within the period of three weeks after the injury in contrast with the pessimism that

arose after the patients returned home. The significance of psychological factors and social support should be considered in the recovery process after hip fracture (Taylor et al., 2010).

There are several qualitative studies focusing on experiences of recovery after hip fracture surgery. The studies consider all types of patients, not only healthy ones (Archibald, 2003; Griffiths et al., 2015; Olsson et al., 2007; Ziden et al., 2008). Olsson et al. (2007) described three groups of patients based on perceptions of responsibility in the rehabilitation process: (1) autonomous, self-sufficient patients who take care of themselves and search for relevant information; (2) modest, frail patients in need of more support who want information but do not ask for it; and (3) heedless, patients who are already dependent, not aware of their own responsibility and not interested in information.

Experiences of the recovery process for older patients have been explored five to nine weeks after a hip fracture with patients in a community hospital (Archibald, 2003). Major themes consisted of coping with the pain, beginning the struggle to recovery and regaining independence. Patients describe struggling with the disability itself, the recovery experience, depending on others and being housebound.

Interviews conducted one month post hip fracture indicate that the recovery process affects personality. Individual changes concerning the relationship with one's own body can cause social and existential changes in relationships with others and to one's life situation as a whole (Ziden et al., 2008). The ability to adapt to reduced mobility was considered to decline with age, but striving to regain pre-fracture mobility was important for managing personal care and day-to-day activities (Griffiths et al., 2015). Patients with hip fractures all worried about their future ability to walk again (Griffiths et al., 2015; Olsson et al., 2007; Ziden et al., 2008). The importance of psychological and social factors in the recovery process was investigated in patients who were independent before the hip frac-

ture (Taylor et al., 2010). To our knowledge no such study with a selected group of previously healthy patients has been conducted in the first days after hip fracture surgery.

The aim of this study was to explore healthy older patients' perception of their own capacity to regain pre-fracture function in the acute phase (the first two to five days) after hip fracture surgery.

Methods

Design

The study had an explorative inductive qualitative design employing interviews.

Data collection

Setting

The study took place in five orthopaedic wards at three hospitals, one university hospital and two central hospitals, in three county councils in Sweden.

Sampling

A convenience sampling procedure was used. Included patients were day two to five post hip fracture surgery at the time of recruitment. Patients were considered eligible for inclusion if they met the following criteria:

- (1) age 65 years or older;
- (2) were classified in the ASA I (healthy) or ASA II (mild systemic disease) (American Society of Anesthesiologists, 1963) (Fig. 1);
- (3) had no cognitive impairment; and
- (4) spoke and understood Swedish.

When a patient was eligible for inclusion, the registered nurse (RN) responsible for the nursing care informed the patients about the study and collected the signed informed consent document.

ASA- classification	
ASA Physical Status I	A normal healthy patient
ASA Physical Status II	A patient with mild systematic disease
ASA Physical Status III	A patient with severe systematic disease
ASA Physical Status IV	A patient with severe systematic disease that is constant threat to life
ASA Physical Status V	A moribund patient who is not expected to survive without the operation

Fig. 1 Physical status classification system, American Society of Anesthesiologists (1963).

Sub Categories	Generic Categories	Main Category
No problem, I will manage this Unexpected event, determination will be needed	Belief in recovery, nothing will be altered	
Need for appraisal Context as a negative influence	Adapting to a new situation in hospital	To end up in a new situation with or without control
When and how to recover Uncertainty	An unpredictable future	

Fig. 2 An overview of the generation of categories.

A total of 30 patients participated in the study; 3 men and 27 women. The mean age was 82.5 years (range: 65–97 years). Six patients were classified as ASA I and the remaining 24 as ASA II. All 30 patients were admitted from their own home and were independent before the fracture.

Procedure

Thirty qualitative semi-structured interviews were conducted at a time that suited each patient (two to five days postoperatively) at three different acute hospitals between August and December 2013. All interviews were carried out in a room without any disturbances. A semi-structured interview guide was used. Prior to the study, the interview guide had been pilot tested and no changes were made. All interviews were conducted by the first author (BG), lasted between 35 and 60 minutes and were recorded and transcribed verbatim. The interviews began with following questions: 'Could you please tell me about what happened when you fell and broke your hip?' and 'What do you think about your possibilities of regaining your functions and recovering after the hip surgery?' Individual follow-up questions were asked to elicit more detailed responses.

Data analysis

Qualitative manifest inductive content analysis as described by [Elo and Kyngäs \(2008\)](#) was used. The content analysis processes contained preparation, organising and reporting phases ([Elo et al., 2014](#)) as detailed below.

Preparation phase

- The interviews were transcribed verbatim.
- The written transcript was read through several times in order to capture the content. The unit of analysis was selected on the basis of the aim of the study, inspired by [Elo and Kyngäs \(2008\)](#).
- The written transcript was read (in Swedish) repeatedly (BG) to grasp the content and to obtain

a sense of the whole. AH and CB read the entirety of the text transcriptions once. The results and selected quotations were then translated from Swedish to English when reporting all steps in the analysis process.

Organisation phase

- Open coding with written headings was performed and the headings were recorded on coding sheets by the first author (BG). After initial coding of 15 transcripts, BG, AH and CB reviewed and discussed the coding to reach agreement.
- The headings of the coding sheets were grouped by gathering those that were similar into higher order subcategories covering the meaning.
- To ensure that data accurately represented the information that the participants provided, similar subcategories were grouped into higher order generic categories, the stage of interpretation degree.
- One main category was generated from the three generic categories in order to give general descriptions of the content of the written material. BG, AH, CB and HH reviewed the subcategories, generic categories and the main category and a final decision was made.

Reporting phase

- An overview of the abstraction process with the generation of subcategories and generic categories was conducted ([Fig. 2](#)). To ensure credibility all authors initially performed the codes individually. All researchers were involved in several dialogues during the analysis process.

To scrutinise the trustworthiness and credibility – how well the categories cover the data – the authors moved back and forth between the interview text, codes, subcategories, generic categories and the main category. These steps were taken to ensure that the intended meaning was faithfully

represented i.e. to confirm conformability and authenticity throughout the entire process. A necessary part of qualitative research is that the researchers should consider whether there could be alternative interpretations. Dependability refers to the stability of data over time and under different conditions; there being a clear description of the context, selection and characteristics of participants, data collection and the process of analysis to address the issues of transferability (Elo et al., 2014; Lincoln and Guba, 1985).

Ethical considerations

The study was approved by the Regional Ethical Board in Lund, Sweden (dnr 2013/320) and performed in accordance with the Declaration of Helsinki (2008). Patients received oral and written information about the study. There was an informal conversation and an explanation of the aim of the study before the interview started. Patients were informed that they could withdraw at any time with no explanation and without affecting their future care. They were also informed that all data would be treated strictly confidentially. Informed consent was obtained before the interview was conducted.

Results

From the analysis one main category emerged: 'Ending up in a new situation with or without control' as a description of patients' perception of their own capacity to regain pre-fracture function after a hip fracture. This main category was developed from three generic categories that were outlined from six subcategories (Fig. 2).

Ending up in a new situation with or without control

Patients' perceptions of their own capacity to regain pre-fracture function in the first two to five days after hip fracture surgery were optimistic. The participants identified that they found themselves in a situation that they had not experienced before and therefore felt ill-equipped to manage. They were not offered opportunities to be actively involved in making decisions about their care. Experiences of being forced to adapt to routines and standard procedures entailed passivity. This was described as having limited influence over care which slowly impaired patients' inner belief in their own capacity to successfully manage their recovery. Little by little participants began to doubt their recovery and be

concerned about their unpredictable future. To believe in one's own ability and commitment were shown to be crucial factors.

Belief in recovery, nothing will be altered

The patients had no doubt about being able to manage this situation. The hip fracture was considered to be an accident that resulted in impairment from which they would recover. They were aware that they possibly had to accept some limitations in function in the near future because of the hip fracture.

No problem, I will manage this

Patients were convinced that the limitations from the hip fracture would pass within a few weeks and life would continue in the same manner as before the fracture. The fracture would, of course, be a reminder for a while, but no difficulties would remain in the future. To believe in one's ability and to not become worried mattered a lot. They thought the hip fracture would not influence their future life, as they felt sound in mind and body and visualised themselves as healthy.

"... I think I will recover, get through this successfully and I will go on with my life as before. I don't think the hip fracture will affect anything in my life situation at all, not at all, no, no..." (Woman, 78 years)

Unexpected event, determination will be needed

The event of fracturing the hip was conveyed as a sudden interruption in life, an accident that resulted in a temporary impairment. In the beginning it was expected to cause some problems with mobilisation and patients expressed the importance of using their inner strength to recover. The most important driving force was about looking forward to regaining their everyday life as soon as possible. The patients considered themselves to have a fighting spirit, durability and persistence that they had adapted from their lifetime experiences.

"... Life will not be in this way in the future, but it is at present, to begin with. This is transient, and I have patience. I think I will recover and be able to keep up with things like before..." (Woman, 89 years)

Adapting to a new situation in hospital

To adapt, accept and follow the routines that were offered in the acute ward resulted in an inner feeling of uncertainty about how to meet expectations and what to manage oneself. The patients expressed their need for confirmation that they were doing well. They

tried hard to adapt to the routines in the acute ward which, according to them, led to passivity.

Need for appraisal

The patients wanted to manage things by themselves: They did not want to be dependent. The hip fracture operation forced them into hospitalisation. It became important to follow practice guidelines and to receive praise from the hospital staff. The patients wanted to live up to expectations. Something that influenced their self-confidence and inner belief in recovery was to feel an improvement day by day.

"... The carers had never before seen a patient get mobilised as quickly as I did after the hip operation. They were quite impressed..." (Woman, 73 years)

Context as a negative influence

Because the patients had no earlier experiences of having a hip fracture or of being hospitalised, they did not know what to expect. They adapted and accepted the view from both hospital staff and relatives that they had become vulnerable due to the hip fracture. Because of some impairment in physical health they were told not to try some activities alone at this stage. As routine in an acute ward, they were assigned a walking frame, which they saw as a symbol of sickness. Patients were requested to be careful and to not walk without assistance. This made them become more dependent on the carers in the ward. At the same time they were expected to carry out some activities, such as activities of daily living (ADL) in a timeframe that they could not decide for themselves. The ward staff informed them that they would receive some help at home.

"... Here I am like a... well someone who does what they instruct me to do... I do not decide anything here. I believe they have taken it from me. I think I will return to earlier function, but now I will... I will... you know, I constantly have to ask for support. I would prefer to be independent..." (Woman, 93 years)

An unpredictable future

The experience of the hip fracture was an unexpected event. Patients cherished hope and felt they would have enough strength to manage everyday life at home after leaving the security of the hospital. They were aware that the time at home would be different from before, and this included some kind of uncertainty about the future.

When and how to recover

At the hospital patients felt secure as they could receive support and help if needed. They specu-

lated about how to manage the pain at home and about the incident itself. These thoughts contributed to the worries about returning home and fears of a new fall. The older adults strived to manage things by themselves as much as possible.

"... Well I will try but then I will see how much strength I've still got, time will show. I really want to try to do it well and manage these exercises I am expected to do. At the hospital you feel strong but when you go home it could be different. You have to be careful. Besides all of that, I do not know if I will regain the same strength as I had before. I wish to recover as soon as possible..." (Man, 83 years)

Uncertainty

Since the hip fracture event was a new experience there was uncertainty about how this would affect life in the future: insight into the ongoing ageing process occurred. To fall and have a hip fracture is expected when you get older. Thoughts about future life concerned doubt, fear and hope regarding the strength to recover and regain previous function. Patients were confident about the fact that time would show what would happen and the need for taking it step by step.

"... I do not think it is good for me to stay at the hospital but you have to cope with that. They have their special procedures they have to follow. I would like to take it easier and not to feel the stress and that you have to cope with certain things that you cannot handle when you have recently undergone an operation. The hip fracture has made me grow old, like turning a new page in a book..." (Woman, 89 years).

Discussion

The main findings in this study resulted in one main category: 'Ending up in a new situation with or without control'. Directly after surgery patients described believing in their own recovery and thinking that nothing would be altered. The hip fracture was an accident from which they believed they would recover. All patients described different life experiences which they thought had made them stronger and gave them a fighting spirit. An acute event often results in temporary dependence on others. It is important to remember to take advantage of patients' desire to regain independence and incorporate opportunities to involve the patient in their own (Fange and Ivanoff, 2009; Ottenvall Hammar et al., 2014). Before the hip fracture patients in this study described themselves as independent and strong. Just

after surgery they were convinced they would regain pre-fracture functions.

The findings show that patients' conviction in having the capacity to regain pre-fracture function changed as they adapted to the routines at the acute hospital ward. The psychological change that arose was crucial and depended on how patients were influenced by the hospital staff and relatives. For example, they were told to be careful, not to mobilise on their own and that they would receive different forms of assistance, which made them passive in their care decisions. The first days after hip fracture surgery patients became concerned about whether they would be forced to change their way of living. They expressed fear of becoming dependent on others and that their life situation would be diminished. Previous studies have found associations between older patients' positive self-esteem in having the potential to recover after a hip fracture surgery and less disability and independence. To maximise older patients' psychological resources in the rehabilitation process it is necessary to focus at the same time on striving to regain physical functions (Bowling and Iliffe, 2011; Ottenvall Hammar et al., 2014; Shaw et al., 2003). A recent study highlights that it is important to mediate realistic expectations in the acute post-operative recovery phase with the care for older patients. The complexities in the aging process result in diminishing available adaptive responses to innumerable stressors. That is the reason why old patients need more time for rehabilitation (Manor and Lipsitz, 2013).

It is important to improve patients' inner drive to recover in the acute orthopaedic ward. During the first two to five days post-surgery, patients in this study felt they had become passive and had a perception of declining function. Even though patients were hopeful they described feeling uncertain about the future. Actually, the acute vulnerability made them commute between hope, doubt and fears regarding how they would manage to regain function, and they expressed uncertainty about whether the hip fracture would affect future life. These findings indicate the importance of paying attention to older patients' self-esteem in order to maintain their belief in recovery. A limitation with the timeframe chosen is that the patients' perceptions may be different after this timeframe as patients began to understand the full impact of the injury. Therefore a follow up study after 4 months has been conducted. To be affected by a hip fracture is an unexpected, stressful event that involves pain, surgery and staying on a ward at an unfamiliar acute hospital, and it affects older patients both in a psychological and physiological manner. Efforts to support self-determination and independence should start shortly

after hip fracture surgery and continue during the whole rehabilitation process.

Patients in this study were convinced that the hip fracture resulted in temporary impairment. They wanted to manage things by themselves and tried to become independent. Their inexperience of hospital care made them adapt and accept the routines, which made them passive. Because of impaired functions they were told that they had to ask for help, to adapt to dependence. At the acute hospital ward patients are transiting into a state described as frail. Older patients are vulnerable and it is essential to combat frailty when undergoing surgical procedures. Frailty is a syndrome characterised by diminished strength, endurance and reduced physiologic function, which increases an individual's vulnerability and develops increased dependency (Morley et al., 2013). There is a distinction between being frail and feeling frail (Grenier, 2006). There is no consensus yet about whether disability should be considered as a component or an outcome of frailty (Levers et al., 2006; Sternberg et al., 2011). The concept 'feeling frail' concerns emotional aspects related to impairment, traumatic events, fear and loss of functions. The emotional impact of bodily changes may threaten identity and maintain a continuous identity reveal (Grenier, 2006; Ottenvall Hammar et al., 2014; Ziden et al., 2008).

The findings of this study were about the transition of patients from being convinced about their recovery to becoming insecure probably due to the hospital staff's and their families' behaviour. In order to strengthen and maintain the patients' self-esteem, it is necessary to change ward processes. Findings show that previously autonomous patients tended to become frail within two to five days post-surgery. This highlights that staff in acute nursing care facilities should pay attention to when and why patients transit into becoming frail. Limited psychological support seems to cause loss of self-confidence about recovery.

Although patients with hip fracture are not a homogenous group, they are treated as such by the health-care system in Sweden. They are all unique with individual expectations. The results from this study highlight the need for person-centred care. According to the findings, the patients' influences in their own care are limited. Older patients value independence very highly. Any loss of function that threatens the ability to manage things by themselves has a considerable detrimental effect on their self-confidence and quality of life (Haak et al., 2007; Salkeld et al., 2000). They are especially vulnerable to loss of dignity because impaired health results in loss of functions and greater physical dependency in acute hospitals. The hospital environment, such as staff behaviour and patient factors,

affects patients' dignity (Baillie, 2009). The care should be holistic and focus on working with the patient's beliefs and values and involve patients in decision making. This could result in patients' satisfaction with care and a feeling of involvement, as described by McCance et al. (2011) and Morgan and Yoder (2012). This shows that ward culture at the acute hospital may affect patients' recovery. These findings emphasise the need for providing approach that is holistic and respectful. However, it is difficult to compare the findings from this study with previous studies because we have not identified any other interview study conducted within the first week after the hip fracture surgery, clustering healthy patients ≥ 65 years and older with a hip fracture.

Strengths and limitations

The purpose of using a semi-structured interview guide was to ensure all topics were covered. A strength of the study was that it included 27 women and three men, which is representative of this group and that the analysis process was conducted by investigator triangulation, i.e. independent coding and analysis by all the researchers. Another strength was that all interviews were conducted by one interviewer. This might mean that there was a slight risk that concepts could be missed.

Conclusion

This study demonstrates that, directly after hip fracture surgery, older healthy patients are convinced that they will regain pre-fracture function. During the first two to five days in the hospital, patients in this study became insecure because they had to adapt to the situation on a hospital ward. They were treated as sick and became passive. This may have altered their confidence in their own capacity to recover. The temporary acute dependence on others is a crucial phase. This highlights that staff in acute nursing care facilities should pay attention to when and why older patients transit into becoming frail. It is important to observe this crucial phase and take advantage of patients' inner driving force to maintain their independence and regain pre-fracture functions. The staff need to take account of patients' different perspectives and find out potential ways of maximising older patients' psychological resources while they are striving to regain physical functions. Patients with a hip fracture are treated as a homogenous group by the healthcare in Sweden. They are all unique with individual expectations. This study highlights the need for a person-centred care for the purpose of retain-

ing older patients' inner driving force to regain pre-fracture function and maintain independence. It is vital to prevent or delay disability in older people who are not yet disabled.

Conflict of interest statement

There are no conflicts of interest for the authors of this manuscript.

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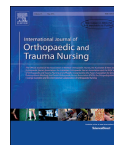
Paper II





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Hip fracture; an interruption that has consequences four months later. A qualitative study



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Recovery of function

ABSTRACT

Background: Effects following a hip fracture often lead to functional disabilities and increased dependence on others. Although persons sustaining a hip fracture constitute a heterogeneous group in Swedish health care, they tend to be treated as a homogenous one.

Aim: The aim of this study was to reveal how previously healthy people, aged 65 years and older, described how they had adapted to daily life four months after a hip fracture.

Method: The follow-up interviews were performed by the first author four months after the hip fracture. Data were analysed using conventional inductive content analysis.

Findings: The results from the interviews highlight that sustaining a hip fracture — even four months later — was seen by the participants as an interruption leading to lasting consequences for everyday life. The recovery process during this period was complex and consisted of both physical and psychological strain. Some were resigned, some strived in order to regain independence and some handled the situation by means of self-confidence and self-efficacy.

Conclusion: Previous healthy and independently-living participants described, in different ways that the hip fracture was an interruption that still affected everyday life. The absence of psychological support may be one of the reasons for dependency after four months.

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1. Introduction

Sustaining a hip fracture is a sudden traumatic event, threatening many aspects of the patient's life due to the effects of functional disability. The reduced mobility often causes increased dependence on others (Magaziner et al., 2000; Pasco et al., 2005). Approximately 17 500 adults sustain a hip fracture annually in Sweden. Data from the Swedish hip fracture register show that 37% of these individuals lived an independent life at the time of the

fracture (Hommel and Bååth, 2015). Restricted mobility has an impact on everyday activities, which in turn affects the patient's emotional state and often results in a loss of confidence. This puts patients at a high risk of becoming permanently disabled and dependent, even after a successful operation (Pasco et al., 2005). There are few studies on why some individuals and patient subgroups recover after sustaining a hip fracture and others do not (Beaupre et al., 2013; Griffiths et al., 2015).

2. Background

Studies have shown that factors affecting the outcomes of a hip fracture are dominated by a functional restorative focus (Liem et al., 2014; Sherrington et al., 2016). Psychosocial factors have effects on recovery but have not attracted much attention in health care

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(Healee et al., 2011). Mobility problems and impaired physical function may affect mental well-being after a hip fracture and lead to reduced ability to participate in social activities. This may result in long-lasting consequences for up to one year and beyond the fracture (Beaupre et al., 2013; Pasco et al., 2005; Zidén et al., 2010). Safe mobility without falls and the fear of falling have been identified as the most important factors in coping with personal care and day-to-day activities in the recovery phase following a hip fracture (Griffiths et al., 2015). In a previous study elderly people described the consequences as being more insecure, anxious and afraid of falling, resulting in more limited mobility (Zidén et al., 2010).

This study is the second of two. The first study was conducted during the acute phase of care in an acute hospital context where patients described a personal transition in the first few days following hip fracture surgery. From being convinced of recovery at admission, there was a change to uncertainty and doubt about their capacity to regain pre-fracture function. Patients described feeling that they were in a new situation, with or without control. They vacillated between fear and hope regarding whether and how they would recover and return to an independent life. This transition occurred as they adapted to the routines in the acute hospital setting and became passive (Gesar et al., 2017). Findings in previous research show that switching from living an independent life to being dependent on others is a challenge that could be regarded as a life transition (Gabrielsson-Jarhult and Nilsen, 2016). For older people, it may take strenuous effort to cope with and adapt to this life-changing situation, mainly regarding decisions upon which they have limited influence (Janlov et al., 2006). Adapting to health care routines influences a person's sense of identity, autonomy and dignity (Gesar et al., 2017; Janlov et al., 2006). The recovery following hip fracture surgery is complex. Because 37% of previously healthy patients do not recover their pre-hip fracture function, it is important to integrate the patient's perspective into the healthcare process. Obtaining knowledge about the recovery process is essential for healthcare decision-making. To our knowledge, no previous interview studies have followed up the same participants twice. Therefore, patients interviewed at the acute phase (Gesar et al., 2017) were interviewed again four months later.

The aim of this study was to reveal how previously healthy people, aged 65 years and older, describe how they have adapted to daily life, four months after a hip fracture.

3. Method

3.1. Design

The study had an explorative, qualitative, follow up design.

3.2. Data collection

3.2.1. Sampling

Study participants were originally recruited following hip fracture surgery in three Swedish hospitals where the first interview took place (Gesar et al., 2017). They were initially considered eligible for inclusion if they lived an independent life before the fracture, were aged 65 years or older, were previously healthy (none or mild systemic disease), had no cognitive impairment and were able to speak and understand Swedish. Out of these 30 participants, 25 agreed to participate in this follow up study (22 women and three men). Seventeen were aged 80 years and older. At four months after surgery, 14 reported reduced mobility, self-care, reduced activities, dependency and no outdoor activities. Three participants had moved into a nursing home. According to participants' preferences, the interviews were performed in their homes

($n = 24$) and at a café ($n = 1$).

3.2.2. Procedure

The follow-up interviews were performed in Swedish by the first author (BG) four months after the hip fracture, between December 2013 and April 2014. A semi-structured interview guide was used. The participants were contacted by telephone by the first author and agreed to make an appointment for an interview. The interviews took the form of a dialogue including follow-up questions aimed to elicit more detailed responses. They lasted between 38 and 63 min and were recorded and transcribed verbatim. The interview guide included the following questions: 'Please tell me something about how you feel today', 'please tell me something about your expectations for the future' and 'please tell me something about what you think about your possibilities to recover and become rehabilitated to everyday life as it was before the hip fracture surgery'. Field notes were written after each interview to develop a complete understanding of the context.

3.2.3. Data analysis

As no pre-existing theory was apparent, data were analysed using conventional inductive content analysis inspired by Hsieh and Shannon (2005). This method is appropriate when existing theory on a phenomenon is limited. The researchers unitised and organised data into categories. Names for the categories should flow from the data and describe findings in a way that makes them explicit (Hsieh and Shannon, 2005). The analysis consisted of the following steps:

- All transcripts were checked for accuracy and read repeatedly to obtain a sense of the whole.
- Each transcript was read (in Swedish) to capture key thoughts and concepts in relation to the aim of the study. Thoughts were written down using the data notes created from the first impression of the interview. An initial analysis highlighted words or statements.
- The texts were broken down into meaningful units related to each other and to the aim of this study.
- Preliminary labels for codes and subcategories were created by the first author (BG) and were organised and grouped, based on similarities and differences, into a hierarchical structure.
- After initial coding of 15 transcripts by the first author (BG), all authors (BG, AH, CB and HH) reviewed and discussed the preliminary labels of codes and categories.
- The remaining transcripts were coded by the first author (BG). When new labels of codes were discovered, they were combined into an existing subcategory. Some of them were renamed because of abstraction. Subcategories were added to the sheet when data did not fit into an existing one. A large number of subcategories were combined and abstracted.
- To address trustworthiness, the whole research group reviewed the labels of codes and subcategories in several meetings. All 25 transcripts were coded, reviewed and cross-examined until no inconsistencies existed in the research group. This procedure was intended to enhance credibility and conformability (Lincoln and Guba, 1985).
- Finally, four subcategories and one category were generated in order to give general descriptions of the content of the written material (Fig. 1). Selected quotations, codes, subcategories and the category were translated from Swedish to English before writing the manuscript for submission.

3.2.4. Ethical considerations

All participants were given oral and written information

Subcategories	Category
<ul style="list-style-type: none"> • The hip fracture impinges on physical recovery • Uncertainty in physical activities has psychological effects • Being at a point of decision: to continue fighting for independence or to give up • To generate a strong driving force 	<ul style="list-style-type: none"> • Hip Fracture, an interruption that has consequences for everyday life

Fig. 1. Subcategories and the category revealed during the analysis.

regarding both the interview that would take place while they were in hospital and the planned follow-up interview. Written informed consent was obtained at the hospital four months prior to the current study, in connection with the first interview (see Gesar et al., 2017). Four months after the first interview, participants were contacted by telephone. They were again informed of the purpose of the study, that participation was voluntary and that they could withdraw at any time without explanation. Confidentiality was assured. The study was approved by the Regional Ethical Board in Lund, Sweden (dnr 2013/320) and performed in accordance with the Declaration of Helsinki (WMA, 2013).

4. Findings

The overarching category highlights that sustaining a hip fracture — even four months later — was seen by the participants as an interruption leading to lasting consequences for everyday life. The analysis revealed four subcategories describing how people aged 65 years and over adapted to daily life four months after a hip fracture (Fig. 1). The category and the four subcategories are described in the following section. The abstraction describes different personal approaches used to adapt to and cope with life four months after hip fracture surgery. Quotations are used to present and describe the findings.

4.1. Hip fracture: an interruption that has consequences for everyday life

The interruption that has consequences for everyday life refers to participants describing that they felt mixed-up and irresolute. Personal capability to put things in order was significant to the participants. Concerns changed between regarding decreased function as a natural part of the ageing process and acceptance of the situation, or struggling and fighting for future independence. The physical effect of the hip fracture impacted patients psychologically and as a consequence, the psychological effects influenced their physical recovery. This affected personal behaviour and everyday personal life in different ways. Participants described being forced to have patience and striving for independence, or being prepared to accept personal changes and to re-evaluate and adapt to everyday chores.

4.2. The hip fracture impinges on physical recovery

Four months after the hip fracture, participants still described perceived physical hindrances as reduced mobility, reduced leg strength and weakness, poor balance and sense of fatigue. These constraints resulted in a less active life, requiring thorough planning prior to physical activities. This need for effort led to less spontaneous activities and more indoor activities:

“... I do not have enough energy. Neither do I rely on my capacity anymore because I feel unsteady. I do not think I can trust this

leg yet. I have to take it well balanced, not fast moving. I am not as cocky as before, nothing could stop me then. Now I have to prepare everything very carefully but it seldom turns out as I planned ...” (Woman, 96 years)

4.3. Uncertainty in physical activities has psychological effects

The long-lasting insecurity about walking properly and the fear of falling again, acting in opposition to the motivation to remain independent, was a real challenge for some participants. The need to adapt to their impaired mobility was described as having an inhibitory effect. They had to adjust their daily activities to a slower rate due to their insecurity regarding their physical abilities. This resulted in the participants becoming more hesitant in taking initiative to perform physical activities. As a consequence of this immobility, everyday life had become isolated. Their lack of energy caused participants to abstain from inviting people to their home or to visit neighbours and friends. The suppressing, unstable condition, alongside the attempt of fighting to regain independence, threatened their self-determination and thus contributed to loneliness, which became very evident and affected everyday life:

“... Now, I am not as active as I used to be. I am now much more afraid of falling again. I am at zero now and have to push myself. I do not walk outdoors like I used to do. No spontaneous activities because everything has to be carefully prepared ...” (Woman, 89 years).

4.4. Being at a point of decision: to continue fighting for independence or to give up

Four months after the hip fracture, the participants were aware that recovery would take longer than expected. It had become necessary to have patience and to fight to regain independence in the future. Participants described this period as one of struggling to maintain the feeling that recovery was progressing. It had become important to consider the most essential matters in life. At this stage, everyday chores took time and they wanted to change this. Some participants expressed a lack of strength to take initiative in several areas of life. The hip fracture had affected their life situation as a whole, both in areas of greater and of lesser importance. Concerns about whether to surrender to dependence or to fight for keeping up their mood were crucial for not losing personal control. To not regain independence in the future was experienced as a possible threat. Participants expressed that, four months after the hip fracture, they had lost the ability and inspiration to participate in social activities. A firm conviction was not to trouble next-of-kin. This was certainly one reason why some of them had home health care or were living in a nursing home, even four months after the hip fracture. This boosted their feeling of resignation:

"... The feeling of not being able to keep things up as before suppresses me. I thought it would go faster. I have always tackled myself out of battles successfully. I am now forced to have patience. I have to put up with some disabilities but I hope gradually to recover. I will not be in a great hurry about it because I am an old person. It is rare, if ever, that I think about the future. If it remains this way ... well, there are several people in this situation ..." (Man, 83 years).

4.5. To generate a strong driving force and determination is the basis for recovery after an operation

The current situation was expressed as contrasting to the past. Some participants had adjusted their daily activities to a slower rate. They described that the essentials for regaining self-esteem and self-confidence included managing everyday chores by themselves at a time chosen by them. Different psychological strategies were used for recovering and for coping with the long recovery time. Some participants planned both for the immediate future as well as with a longer perspective. Some had already participated in activities that had been planned before the hip fracture. Being able to fulfil these activities or to travel as previously planned strengthened their self-esteem. Plans usually involved next-of-kin to whom they felt responsibilities. Some participants expressed maintained self-esteem, either with or without social support. They were motivated to perform physical activities by taking small steps towards their goals. Success in regaining previous function was expressed as a task that was completely up to them:

"... I have internal power to become as I was before. I am a realist and I am healthy, without comorbidities that could have made it more complicated. Neither am I confused. What matters is to have the ability to put things in order. I have an independent nature and decide on everyday tasks on my own. I am persistent, goal-oriented. Now I use just one crutch. I am so grateful things have gone so well ..." (Woman, 83 years).

5. Discussion

This follow-up study revealed that hip fractures still had consequences for everyday life four months after the fracture. Patients' expectations during this period of four months changed. Initially, in the acute hospital, they were convinced that they would regain previous functions and everyday life (Gesar et al., 2017). Four months later the accident had affected personal ego in physical, psychological and social aspects. Still, they were well aware that maintaining a strong driving force and determination was important for recovery. To deal with this was completely their own responsibility.

These previously healthy people found the recovery process during this four month period complex and it consisted of both physical and psychological strain. The changes observed over time reveal that an absence of psychological support may be one of the reasons for dependency after four months. Findings in this study are consistent with previous studies conducted on groups, consisting of not only healthy individuals, dealing with the interdependency between physical functions and emotional health and their effects on everyday life (Snowden et al., 2014; Taylor et al., 2010; Zidén et al., 2010). The negative consequences of a hip fracture can be long-lasting (Dyer et al., 2016; Taylor et al., 2010; Zidén et al., 2010). One year after the hip fracture, insecurity remained that resulted in a more restricted and isolated everyday life

compared to before the fracture. Participants' optimism during inpatient rehabilitation changed to pessimism after returning home (Taylor et al., 2010). Impaired mobility, health, quality of life and self-rated independence after a hip fracture could last for two years when compared to age-matched controls. The bulk of functional recovery occurred within 6 months after the hip fracture (Dyer et al., 2016).

The participants' uncertainty of regaining pre-fracture function in the acute phase (Gesar et al., 2017) had been tackled in different ways four months later. Those who had adopted passive strategies made no decisions of their own and did not plan for the future. Home care aides and next-of-kin decided what the participant was capable of and the right time for certain activities. Thus, affected by impaired mobility and psychological restraints, their life situation had changed. The life transition that had occurred within a period of four months had caused previously healthy people to consider surrendering. Others struggled with efforts to regain independence. Some participants were fully convinced about their ability to regain pre-fracture functions. Even for this previously healthy population, the recovery process was a challenge. In several previous studies, people with hip fractures are generalised as frail, disabled and comorbid. This is seen as a reason for being sensitive to complications, comorbidities and declined function and mortality after the hip fracture (Johnell and Kanis, 2006; Crotty et al., 2010; Liem et al., 2014). Although the individuals examined in this study were all previously healthy, the group was still heterogeneous.

Concerns about being forced into a life transition were expressed by some participants. The functional decline four months after the hip fracture seemed to threaten previously healthy people's independence and could potentially force them into a life transition. If function were to decline further, dependence may also increase. Some participants described that the declined function was a result of ageing and could not be changed. Those participants who vacillated may have been at a crucial time that could incorporate gradual disengagement from old behaviours. Transition is a concept that involves reorientation and adaptive activities to manage changes over time that may affect self-identity (Kralik et al., 2006). Self-identity and transition seem to be closely linked. Understanding the threat of the transition process could support people to move through their temporarily decreased function. It seems they need to be coached to strengthen their dignity, self-confidence, self-esteem, self-determination and perceived control.

Participants in this study, who had the potential to recover, described the hip fracture as an accident. The hip fracture is a temporary condition, which differs to a chronic disease for which there is no cure. Consistent with another study, participants expressed that strong determination was required for having good potential for recovery (Zidén et al., 2010). They had developed a strategy using self-determined sub-targets. Four months after the hip fracture, some of them had participated in activities that were planned before the hip fracture, such as visiting friends and travelling by car or by air. This strengthened their self-esteem and self-efficacy. These people emphasised that self-determination, a positive attitude and social support played significant roles in their ability to initiate and maintain physical activity. Self-efficacy is a central psychological construct in social cognitive theory, described as the personal belief in one's ability to carry out a specific behaviour (Bandura, 1997). Personal emphasis factors were described as their own determination to walk again, mental attitude, willingness to learn and improve and determination never to give up. Goals also facilitated recovery, such as moving back home, regaining independence and being able to walk again. Challenges and unpleasant sensations such as pain or medical complications

hindered recovery (Young and Resnick, 2009).

Components of person-centred, holistic nursing care may have a mediating role in long-term functional outcomes. During the four months of recovery, participants in this study seemed to lack psychological support. Fundamentals of care include the physical, psychosocial and relational dimensions, which should be embedded in the way of thinking, reflecting and estimating by nurses (Kitson et al., 2014). Patients cared for in trauma units expect and understand that care focuses on physical tasks rather than psychological care (Elmqvist et al., 2012), which may lead to a lack of psychological support (Nyström, 2002). Such support could be undertaken when patients are discharged from hospital by incorporating follow-up calls. Establishing a trusting relationship between the individual and the nursing team in the hospital would ensure consistency to support mutual goals in self-care assessment (Kitson et al., 2014).

Fundamentals of care between nurses and participants in this study could strengthen personal dignity (Baillie, 2009), self-confidence, self-esteem, self-determination (Taylor et al., 2010) and perceived control (Bandura, 1997; Shaw et al., 2003). This could be due to the fact that hip fracture care includes the entire continuum of care (Hommel and Bääth, 2015). Findings in this study raise concerns regarding the preparation of nurses and participants to deal with psychological care issues. Successful collaboration between nurses, physicians and physiotherapists, through a holistic perspective, may optimise patients' abilities to recover to pre-fracture functions.

The professional purpose of recovery is to restore patients to their previous physical, mental and social capabilities after a hip fracture. Findings in this study reveal both physical and psychological challenges in optimising the recovery process after a hip fracture. When demands overwhelm an individual's subjective perception of their resources, they will be less eager to act. Further research on whether physical and psychosocial interactions affect recovery after a hip fracture may contribute important findings to the optimisation of the recovery process. This may provide a framework for person-centred care by establishing and maintaining relationships with the purpose of strengthening self-efficacy. Person-centredness describes a standard of care that places people at the centre by moving away from fragmented, medically-dominated care towards care that is relationship-focused, holistic and collaborative (McCance et al., 2011).

5.1. Strengths and limitations

The trustworthiness of studies with a qualitative design can be debated, in terms of their dependability, conformability, credibility and transferability (Lincoln and Guba, 1985). In order to ensure dependability, all interviews were conducted by the first author. This can be seen both as a strength and a limitation. Conformability refers to the objectivity of the researcher. The participants knew the interviewer from the first round of interviews, which may have decreased their confidence in the situation. The same questions were used in each interview in order to ensure that they covered the same areas. Despite using the convenience sampling procedure (Gesar et al., 2017), saturation was reached as no new subcategories reflecting the study aim could be developed from the texts. Conformability and credibility were enhanced through the data analysis conducted by investigator triangulation, independent coding and analysis by all the researchers. By providing a clear description of the context, selection and characteristics of the participants, the authors have helped the reader to appraise this study's transferability to similar contexts (Hsieh and Shannon, 2005; Polit and Beck, 2010).

6. Conclusion

This follow-up study highlights that the recovery phase after a hip fracture is multifactorial. Previously healthy and independently-living participants described, in different ways, that the hip fracture was an interruption that still affected everyday life. It was described that physical impairments had psychological effects and that psychological factors had physical impacts. Some of these previously healthy people had given up, some fought for independence and some handled the situation by means of self-esteem and power. Generating a strong driving force and determination was seen as important for recovery.

Psychological and psychosocial support is of utmost importance from the time of the hip fracture throughout the rehabilitation period in order to regain pre-fracture function and independence. Findings in this study are of clinical importance since the perspectives of the individuals may complement standardised health professional evaluation. Nursing care and person-centred care may have a mediating role in long-term functional outcomes in hip fracture recovery. This study shows that person-related factors may fill a gap in this field.

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Paper III



ARTICLE

Patient-reported outcomes at acute hospital stay and four months after hip fracture surgery. A register and questionnaire study

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Abstract

Introduction: The large and increasing number of hip fracture patients, in combination with the large impact that this is having on daily living activities, is emphasizing the importance of identifying factors that have a detrimental impact on post-operative outcomes. There are benefits to planning the ward in a way that prevents a steep decline in recovery after hip fracture surgery. Adding the patient's perspective into the healthcare assessment, *via* shared healthcare decision-making, allows the patient's needs and preferences to be taken fully into account. The aim of this study was to identify the factors that predict how patients recover after hip fracture surgery.

Methods: A descriptive quality register/questionnaire study in acute orthopaedic wards, 2 to 5 days after surgery, with a follow-up 4 months later. The patients included were ≥ 65 years of age and had been previously healthy and living independently before the hip fracture.

Results: The participants in this study had returned to their own homes after 4 months, but only 21% reported themselves as being fully or almost fully recovered. In several domains of recovery, all 3 age groups (65-74, 75-84 and 85-97) reported different challenges both during their acute hospital stay and at the 4 months follow-up. The recovery phase is heterogeneous and requires individual care. The way that this is planned has an influence on patient outcome.

Conclusion: Patients sustaining a hip fracture are heterogeneous and different age groups experience different challenges. At 4 months follow-up, one fifth of the participants reported themselves fully or almost fully recovered and most of them had returned to their own homes. The Swedish National Hip Fracture Register and the patient-reported questionnaires employed in this study are appropriate tools to audit further development of healthcare to improve quality of life after hip fracture surgery.

Keywords

Clinical outcomes, hip fractures, needs preferences, nursing, patient perspectives, patient-reported outcomes, person-centered healthcare, quality of life, quality register, questionnaire, recovery, shared clinical decision-making, Swedish National Hip Fracture Register

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Introduction

The number of hip fracture patients will continue to increase due to demographic changes and osteoporosis [1] in combination with falls [2]. The Swedish National Hip Fracture Register (RIKSHÖFT) is designed to improve patient care and is a necessary part of quality assurance for hip fracture patients, covering approximately 95% of individuals sustaining a hip fracture in Sweden. Since the

1990s, other European countries have adopted their own hip fracture registers, facilitating the comparison of hip fracture care outcomes within and between countries [3].

Previous research on the outcomes of hip fractures often focus on surgical methods, morbidity, complications, waiting time for surgery, physical functions and mortality [4,5]. While these factors are important, they do not capture all aspects of hip fracture recovery, which consists of both physical and psychological factors [6,7]. The

patient's perspective is important in healthcare decision-making [8], yet if the evaluation of hip fracture care mainly relies purely on clinical outcomes, patients' preferences tend to be ignored [8]. The large and increasing number of hip fracture patients, in combination with the large impact that this is having on patients' daily living activities, emphasizes the importance of identifying those factors that have a detrimental effect on post-operative outcomes [9,10].

The findings of a previous study demonstrated that healthy patients with a hip fracture believed that they would recover when admitted to hospital, but on becoming used to the ward culture, a tendency to passivity was observed. This resulted in insecurity regarding their capacity to regain previous functions [11]. Healthier patients may need extra care to prevent them from suffering from a steep decline in recovery after a hip fracture [9]. Patient-reported outcome measures would increase the requirements for and support provided for value-based surgical holistic care outcomes [12] given that hip fracture may threaten healthy patients' future life situation [13].

In this study, we attempted to include the patient perspective both during the acute hospital stay and 4 months after hip fracture surgery in a cluster of previously healthy adults. The aim was to identify factors that predict how patients will recover after hip fracture surgery.

Method and Materials

A descriptive quality register and questionnaire study was employed in this study. Data were collected upon admission to hospital (before and after hip fracture surgery) and at a follow-up consultation after 4 months. The study took place in 5 orthopaedic wards at 3 hospitals (one university hospital in southern Sweden and 2 hospitals in central Sweden). Patients treated in 2014 were included. This study was approved by the Ethical Board in Lund, Sweden (Dnr 2013/320).

Participants

Previously healthy patients ≥ 65 years of age admitted to the included hospitals for a hip fracture were invited to participate. The inclusion criteria were: (1) patients with a hip fracture, (2) an age of ≥ 65 , (3) a classification of I = A normal healthy patient or II = A patient with mild systemic disease according to the American Society of Anesthesiologists (ASA) [14], (4) independent living situation before the fracture, (5) the ability to speak and understand Swedish and (6) no cognitive impairment (Pfeiffer-test 8-10) [15]. At baseline, a consecutive sample of 188 patients participated; of these 160 patients participated in the 4 month follow-up.

Data collection

The patients were invited to participate in the study as soon as possible after surgery. They received oral and written information about the study from the Registered Nurse (RN) responsible for their nursing care. The patients were informed that they could withdraw at any time with no explanation and without this affecting their future care. The Swedish National Hip Fracture Register including the Euroqol (EQ-5D, 3L) was routinely completed on admission to the acute hospital before surgery, providing information on what their situation had been one week before the fracture. Demographic information such as age, gender, ASA-classification, type of hip fracture, surgical procedure, walking ability and living condition were collected from the Swedish National Hip Fracture Register [16]. Patients were also asked to answer two validated and reliability-tested questionnaires: The Swedish version of the Falls Efficacy Scale (FES(S)) [17] and the Post-operative Recovery Profile (PRP) [18].

Measurements

The Swedish National Hip Fracture Register consists of the collection of data during both the acute hospital stay and 4 months after surgery [16]. *Hip fracture primary operation form 1* contains demographical data about the living condition and mobility of patients before their hip fracture, items on medical care and nursing-sensitive quality indicators and the location of discharge. *Hip fracture 4-month follow up form 2* consists of items such as place of residence, pain and mobility (Table 1).

EQ-5D-3L is a translated, valid and reliability tested instrument [19] and is a part of The Swedish National Hip Fracture Quality Register, widely used for measuring health quality. It comprises 5 self-assessed items (mobility, self-care, usual activities, pain/discomfort and anxiety/depression) [20].

The Swedish version of the Falls Efficacy Scale (FES(S)) is a multi-item questionnaire consisting of 13 items for the self-assessment of perceived confidence in performing common everyday tasks without fear of falling [17]. The scale comprises 2 parts: 6 items measuring Personal Activities of Daily Living (PADL), 6 items covering Instrumental Activities of Daily Living (IADL). Each subscale encompasses 6 activities (with a maximum score of 60). Item number 7, walking up and down stairs, is regarded as the in-between item, with a maximum score of 10. Each item is graded on an 11-point visual analogue scale from 0 (not confident at all) to 10 (completely confident) in performing the specified activity without falling. The full summed scale gives a possible total score of 130 points [17].

The Postoperative Recovery Profile (PRP) questionnaire is a multi-item questionnaire with 5 dimensions at the individual and group level. According to Allvin *et al.* [18], it is useful for studying the progress of patient-reported post-operative recovery after surgical treatment. Patients described their self-assessed problems/difficulties, which are formulated as a statement

Table 1 Demographical data of included patients at admission and after 4 months according to the Swedish National Hip Fracture Register (RIKSHÖFT) forms

	Before admission N=188	At 4 months N=160	P-value
Gender n (%)			0.658
Women	147 (78.2)	127 (79.4)	
Men	41 (21.8)	33 (20.6)	
Age m (SD)	79.96 (8.11)	80.5 (7.6)	0.023
Age groups n (%)			
65-74	50 (26.6)	43 (26.9)	
75-84	80 (42.5)	73 (45.6)	
85-105	58 (30.8)	44 (27.5)	
Admitted from n (%)			0.001
Own home	181 (96.3)	153 (95.6)	
Sheltered housing	1 (0.5)	6 (3.8)	
Acute hospital	6 (3.2)	1 (0.6)	
Living alone n (%)			0.025
Yes	108 (57.4)	90 (56.2)	
No	80 (42.6)	70 (43.8)	
Mobility n (%)			0.001
Walked alone out of doors	175 (93.1)	112 (70)	
Walked out of doors only if accompanied	9 (4.8)	18 (11.2)	
Walked alone indoors but not out of doors	4 (2.1)	13 (8.1)	
Walked indoors only if accompanied	-	14 (8.8)	
Unable to walk	-	3 (1.9)	
Walking aids n (%)			0.012
Can walk without aids	144 (76.3)	99 (61.9)	
Two aids	2 (1.1)	3 (1.9)	
Frame/Rollator	42 (22.3)	57 (35.6)	
Wheelchair/bedbound	-	1 (0.6)	
ASA grade n (%)			0.027
ASA 1	35 (18.62)	33 (20.6)	
ASA 2	153 (81.38)	127 (79.4)	
Type of Fracture n (%)			0.062
1.Undisplaced cervical fracture	30 (16)	26 (16.2)	
2.Displaced cervical fracture	78 (41.5)	68 (42.5)	
3.Basocervical fracture	6 (3.2)	6 (3.8)	
4.Trochanteric two fragments fracture	39 (20.7)	32 (20)	
5.Trochanteric fracture multi fragments	20 (10.6)	15 (9.4)	
6.Subtrochanteric fracture	15 (8)	13 (8.1)	

on the questionnaire, for example, 'right now I am experiencing nausea'. The responses are categorized into one of 4 choices: *severe*, *moderate*, *mild* or *none*. The items in each part in the dimensions are presented below (Box 1).

Box 1 Single items included in dimensions in Post-operative Recovery Profile questionnaire

Dimensions in PRP	
Physical symptoms	Pain, nausea, fatigue, appetite changes, sleeping difficulties
Physical functions	Gastrointestinal function, bladder function, mobilization, muscle weakness, sexual function
Psychological	Anxiety and worry, feeling down, feeling lonely/abandoned, difficulties in concentration
Social	Social activities, dependence on others, interest in surroundings
Activity	Re-establish everyday life, personal hygiene

Statistical analysis

Descriptive statistics were calculated in frequencies and proportions (%), mean (standard deviation) and median (interquartile range). Comparisons between the 2 points of time were analysed using the two-sample t-test (mean-age), chi-square test for binary variables and the Kruskal-Wallis test for categorical data. In all of the tests, the level of statistical significance was set at <0.05. Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS), version 21.0 (IBM Corp, Armonk, New York).

Results

A total of 188 patients were included upon admission to hospital: 147 women (78.2%) and 41 men (21.8%). The mean age was 79.96 years (SD 8.11) (Table 1). At the 4 months follow-up, 28 patients dropped out, leaving 160 patients in the study. Of these 28 patients, 5 died and the remaining 23 did not return their questionnaires. There was

no statistically significant difference between gender and cognitive status from baseline to the 4 months follow-up. However, there was a significant difference in mean age between baseline and the follow-up because of drop outs of 28 participants who were older (mean age 83.46 (SD 10.1) (N=28). Mean age for the participants who completed the study was 79.34 (SD 7.6) (N=160) (Table 2 & Table 3). During the acute hospital stay, no patient considered themselves fully recovered 2 to 5 days after surgery. The length of patients' hospital stay varied between 2 and 27 days (mean 6.1).

Table 2 Demographical data of patients with missing data at 4 months follow-up according to the Swedish National Hip Fracture Register (RIKSHÖFT) forms

	Before admission (N=28)
Gender n (%)	
Women	20 (71.4)
Men	8 (28.6)
Age m (SD)	83.46 (10.1)
Age groups n (%)	
65-74	6 (21.4)
75-84	6 (21.4)
84-105	16 (57.2)
Admitted from n (%)	
Own home	28 (100)
Living alone n (%)	
Yes	20 (71.4)
No	8 (28.6)
Mobility n (%)	
Walked alone out of doors	25 (89.3)
Walked out of doors only if accompanied	2 (7.1)
Walked alone indoors but not out of doors	1 (3.6)
Walking aids n (%)	
Can walk without aids	17 (60.7)
Two aids	1 (3.6)
Frame/Rollator	10 (35.7)
ASA grade n (%)	
ASA 1	1 (3.6)
ASA 2	27 (96.4)
Type of Fracture n (%)	
1.Undisplaced cervical fracture	5 (17.9)
2.Displaced cervical fracture	10 (35.6)
3.Basocervical fracture	0 (0)
4.Trochanteric two fragments fracture	7 (25)
5.Trochanteric fracture multi fragments	5 (17.9)
6.Subtrochanteric fracture	1 (3.6)

The Swedish National Hip Fracture Register

The Swedish National Hip Fracture Register showed differences in mobility. At baseline, 93.1% of the patients had walked independently alone outdoors. This decreased to 70% ($p = 0.011$) at the 4 month follow-up. The same pattern was detected for walking without aids. At baseline, the percentage had been 70.7 % and this decreased to 53.1% ($p = 0.012$) at the 4-month follow-up (Table 1).

Table 3 Demographical data of patients who fulfilled follow-up according to the Swedish National Hip Fracture Register (RIKSHÖFT) forms

	Before admission N=160
Gender n (%)	
Women	127 (79.4)
Men	33 (20.6)
Age m (SD)	79.34 (7.6)
Age groups n (%)	
65-74	43 (26.9)
75-84	73 (45.6)
85-105	44 (27.5)
Admitted from n (%)	
Own home	153 (95.6)
Sheltered housing	1 (0.6)
Acute hospital	6 (3.8)
Living alone n (%)	
Yes	88 (55)
No	72 (45)
Mobility n (%)	
Walked alone out of doors	150 (93.8)
Walked out of doors only if accompanied	7 (4.4)
Walked alone indoors but not out of doors	3 (1.9)
Walking aids n (%)	
Can walk without aids	127 (79.4)
Two aids	1 (0.6)
Frame/Rollator	32 (20)
ASA grade n (%)	
ASA 1	34 (21.3)
ASA 2	126 (78.8)
Type of Fracture n (%)	
1.Undisplaced cervical fracture	25 (15.6)
2.Displaced cervical fracture	68 (42.5)
3.Basocervical fracture	6 (3.8)
4.Trochanteric two fragments fracture	32 (20)
5.Trochanteric fracture multi fragments	15 (9.4)
6.Subtrochanteric fracture	14 (8.8)

EQ-5D

The EQ-5D showed that, in 4 out of 5 items, there was a difference between baseline and the 4-month follow-up: *mobility* ($p < 0.001$), performing *usual activities* ($p < 0.001$), *pain/discomfort* ($p < 0.001$) and *anxiety/depression* ($p < 0.001$). At baseline, 63.4% of patients had no problems with *mobility*; this decreased to 26.1% at the 4-month follow-up ($p < 0.001$). Those who had no problems with *usual activities* decreased from 71.8% to 48.9%. Those who had no *pain/discomfort* decreased from 52.1% to 39.9% and those who had no *anxiety/depression* decreased from 67.6% to 55.9%.

An analysis of the subgroups showed that patients in the 75-84 age group self-rated a significant decrease in *mobility* after 4 months ($p = 0.004$). Concerning *usual activities*, there was a significant decrease for the 75-84 ($p < 0.001$) and 85-97 ($p = 0.007$) age groups. For *pain/discomfort*, a significant decrease could be seen in the

Table 4 Median score changes of single items and the subscales in the Falls Efficacy Scale (S), at acute hospital 2-5 days after surgery and follow-up at 4 months

Activity		Acute hospital N=186	Follow up 4 months N=160	P-value
1. Get in and out of bed	Median (Q1-Q3)	2 (0-6)	9 (7-10)	0.221
2. Get on and off toilet	Median (Q1-Q3)	2 (0-6)	10 (7-10)	0.188
3. Personal grooming	Median (Q1-Q3)	5 (2-8)	10 (9-10)	0.615
4. Get in/out of a chair	Median (Q1-Q3)	3 (1-6)	9 (6-10)	0.025
5. Get dressed/undressed	Median (Q1-Q3)	3 (1-6)	9 (7-10)	0.288
6. Take bath/shower	Median (Q1-Q3)	1 (1-5)	9 (6.3-10)	0.333
7. Go up/down stairs	Median (Q1-Q3)	0 (0-3)	8 (3.3-9)	0.716
8. Walk around the block	Median (Q1-Q3)	0 (0-3)	8 (5-10)	0.053
9. Reach into cabinets	Median (Q1-Q3)	1 (0-4)	8 (4-10)	0.318
10. Light housekeeping	Median (Q1-Q3)	0 (0-3)	8 (4-10)	0.194
11. Prepare meals	Median (Q1-Q3)	1 (0-5)	9 (6-10)	0.224
12. Hurry answer telephone	Median (Q1-Q3)	1 (0-5)	7 (4-10)	0.435
13. Simple shopping	Median (Q1-Q3)	0 (0-3)	7 (3.5-10)	0.052
PADL	Median (Q1-Q3)	19 (6-36)	55.5 (40-60)	0.054
IADL	Median (Q1-Q3)	7 (1-21)	47 (26-56)	0.217
SUM TOTAL	Median (Q1-Q3)	27 (9.8-55)	61 (46.2-77.8)	0.559

The scale is divided into 2 subscales; PADL, personal activities in daily living (items 1-6) and IADL, instrumental activities in daily living (items 8-13) (maximal possible scores= 60 for each subscale). Item 7 (walking up and down stairs) is regarded as an intermediate item. The full summed scale gives a possible total score of 130 points.

65-74 and 75-84 ($p=0.05$) age groups. Finally, concerning *anxiety/depression* a decrease could be seen in the 75-84 and 85-97 ($p=0.03$) age groups.

Falls Efficacy Scale (S)

At 4 months follow-up, the participants' confidence was highest in the following 3 items: *getting on and off the toilet* (completely confident ($n=88$ (56.1%)) and partly confident ($n=54$ (33.4%)), *personal grooming* (completely confident ($n=110$ (70.1%)) and partly confident, ($n=34$ (21.6%)) and *get dressed/undressed* (completely confident ($n=70$ (46.2%)) and partly confident ($n=65$ (41.8%)).

After 4 months, the participants' confidence was lowest in the following 3 items: *going up/down stairs* (completely confident ($n=38$ (24.4%)) and partly confident ($n=75$ (48.1%)), *light housekeeping* (completely confident ($n=47$ (30.3%)) and partly confident ($n=60$ (38.7%)) and *simple shopping* (completely confident ($n=48$ (31.4%)) and partly confident ($n=61$ (39.8%)).

The median at the full summed FES(S) scale at 4 months follow-up was 61 (46.2-77.8) with the highest values regarding activities such as *personal grooming*,

getting on and off the toilet. In general, participants reported higher confidence in PADL and lower confidence in IADL (Table 4).

The Post-Operative Recovery Profile

During the acute hospital stay, no patient considered themselves as fully recovered 2 to 5 days after surgery. Concerning their *physical symptoms* in the acute phase (2 to 5 days after surgery), the greatest problem was reported in the item *pain* (severe or moderate ($n=137$ (73.2%)) (Table 5), with the highest level reported in the 65-74 age group.

Furthermore, the item *fatigue* was reported as being severe or moderate ($n=113$ (60.4%)) (Table 5), with the highest level reported in the 75-84 age group. For *physical functions* in the acute phase, the most problems were reported in the item *mobilisation dysfunction* (severe or moderate $n=138$ (73.8%)) (Table 5), with the highest levels reported in the 75-84 age group. *Muscle weakness* was also highly reported (severe or moderate $n=113$ (61.1%)) (Table 5). In the social part of the questionnaire, the item *dependence on help from others* was reported as (severe or

Table 5 Number and proportion (%) of participants self-reported level of problem in single items at Post-operative Recovery Profile, acute hospital 2-5 days after surgery and at follow-up at 4 months

n (%)	At hospital (2-5 days after surgery) N=188				At 4 month N=160			
	Severe	Moderate	Mild	None	Severe	Moderate	Mild	None
Physical symptoms								
Pain	64 (34.2)	73 (39)	43 (23)	7 (3.7)	5 (3.1)	29 (18.1)	74 (46.3)	52 (32.5)
Nausea	7 (3.7)	32 (17)	58 (30.9)	91 (48.4)	0 (0)	6 (3.8)	17 (10.6)	137 (85.6)
Fatigue	37 (19.8)	76 (40.6)	61 (32.6)	13 (7)	6 (3.8)	27 (16.9)	78 (48.8)	49 (30.6)
Appetite change	22 (11.8)	63 (33.9)	50 (26.9)	51 (27.4)	1 (0.6)	15 (9.4)	27 (17)	116 (73)
Sleeping difficulties	18 (9.6)	73 (39)	56 (29.9)	40 (21.4)	2 (1.3)	27 (17)	59 (37.1)	71 (44.7)
Physical Functions								
Gastrointestinal function	24 (13)	47 (25.4)	52 (28.1)	62 (33.5)	7 (4.4)	29 (18.1)	33 (20.6)	91 (56.9)
Bladder function	8 (4.4)	27 (14.8)	46 (25.1)	102 (55.7)	5 (3.1)	5 (3.1)	30 (18.8)	120 (75)
Mobilization	69 (36.9)	69 (36.9)	35 (18.7)	14 (7.5)	5 (3.1)	38 (23.8)	58 (36.3)	59 (36.9)
Muscle weakness	34 (18.4)	79 (42.7)	56 (30.3)	16 (8.5)	7 (4.4)	45 (28.3)	75 (47.2)	32 (20.1)
Sexual function					***	15 (11.5)	17 (13)	89 (67.9)
Psychological								
Anxiety and worry	21 (11.2)	43 (22.9)	64 (34)	60 (31.9)	1 (0.6)	31 (19.4)	49 (30.6)	79 (49.4)
Feeling down	12 (6.4)	39 (20.7)	59 (31.4)	78 (41.5)	1 (0.6)	27 (17)	58 (36.5)	73 (45.9)
Feeling lonely/abandoned	12 (6.4)	26 (13.8)	43 (22.9)	107 (56.9)	2 (1.3)	21 (13.1)	33 (20.6)	104 (65)
Concentration difficulties	7 (3.8)	32 (17.3)	75 (40.5)	71 (38.4)	0 (0)	20 (12.5)	49 (30.6)	91 (56.9)
Social								
Social activities	31 (16.7)	56 (30.1)	59 (31.7)	40 (21.5)	5 (3.1)	40 (25)	55 (34.4)	60 (37.5)
Dependence on others	49 (26.8)	78 (42.6)	40 (21.9)	16 (8.7)	10 (6.3)	43 (26.9)	64 (40)	43 (26.9)
Interest in surroundings	23 (12.3)	36 (19.3)	42 (22.5)	86 (46)	1 (0.6)	7 (4.4)	20 (12.6)	131 (82.4)
Activity								
Re-establish everyday life					15 (9.4)	41 (25.6)	70 (43.8)	34 (21.3)
Personal hygiene	28 (14.9)	74 (39.4)	41 (21.8)	45 (23.9)	4 (2.5)	11 (6.9)	35 (21.9)	110 (68.8)

*Missing one participant, **Missing two participants, ***Missing 29 participants

moderate $n=127$ (69.4%)) (Table 5), with the highest levels reported in the 75-84 age group. For the remaining items, there were no differences between the groups during the acute phase.

The reported items that were having a restraining influence on recovery at 4 months were *mobilisation dysfunction*, *muscle weakness*, *restrictions in social activities*, *dependence on others* and *re-establishing everyday life*. The highest level of problems reported in the item *mobilisation dysfunction* was in the 75-84 and 85-97 age groups. In the item *muscle weakness*, most problems were reported in the 65-74 and 85-97 age groups. Most of the difficulties with *social activities* were in the 65-74 and 85-97 age groups, with most problems with *dependence on others* were reported in the 65-74 age group. Most of the problems with *re-establishing everyday life* were reported in the 65-74 and 85-97 age groups. The status of being fully or almost fully recovered at 4 months was reported by 21% of patients at the group level (Table 6). The items showing the most improvement after 4 months were *pain* (mild or none 78.8%), *nausea* (mild or none 96.2%), *fatigue* (mild or none 79.4%), *appetite change* (mild or none 90.0%) and *sleeping difficulties* (mild or none 81.8%). Further improvements were made in *interest in surroundings* (mild/none 95.0%) and *personal hygiene* (mild or none 90.7%).

Table 6 Post-operative Recovery Profile (PRP), showing the frequencies of participants n (%) and assessed total sum of items scored with “none problem” at 4 months

Global score Post-operative Recovery Profile at 4 months	Recovery profile n (%)
19 (fully recovered)	8 (5)
15-18 (almost fully recovered)	25 (16)
8-14 (partly recovered)	64 (40)
7 (slightly recovered)	7 (4)
<7 (not at all recovered)	56 (35)

Discussion

The aim of this study was to identify those factors that predict recovery after hip fracture surgery. To gain more knowledge and a broad picture from the individuals' perspective of the difficulties of recovering after a hip fracture we used three self-reported questionnaires. The most important contribution of this study was that, for several of the items, the three age groups reported different challenges. Let us reconsider the fact that this was a sample selected from previously healthy, independently living people before the hip fracture. In practice, the surviving participants had returned to their place of residence four months after surgery. After four months, the results of this study observed declined mobility, a higher proportion of patients using walking aids and limitations in performing outdoor activities. Furthermore, patients in this

study reported impaired mobility and deterioration in performing their usual activities in comparison with their situation before the hip fracture.

The results of this study are in accordance with previous research [4,6]. Only 21% of these previously healthy patients reported themselves as being fully or almost fully recovered at four months, 40% reported partly recovered and 39% reported slightly or not recovered at all. Previous research has identified higher recovery rates back to their previous level of functions among people discharged to their own homes compared to those discharged to a nursing home [4,21]. However, a Swedish study showed that the optimal length of a hospital stay after hip fracture surgery was ≥ 10 days [22]. For each reduced day, the risk of death within 30 days increased by 13%. The risk of death increased threefold for patients discharged to a nursing home within ≤ 10 days. Patients cared for in geriatric ward hospitals had a 14% lower risk of re-admission within 30 days of discharge compared to those cared for on a regular hospital ward [22]. One interpretation of why 40% of the participants in this study reported limited recovery is that, in Sweden, there are no national clinical guidelines for the care for patients with a hip fracture following discharge. The findings of a recent interview study were that, four months after the hip fracture, the accident was still affecting the everyday lives of previously healthy participants. According to those participants, the most important factor in recovery was generating a strong inner driving force for recovering [13].

At four months follow-up our patients had the highest confidence (high fall-related self-efficacy) in performing PADL. Low confidence (low fall-related self-efficacy) was reported in performing IADL, as well as the single item “go up/down stairs”. Together, all of the measurements taken indicated similar reported problems: difficulties in mobility, muscle weakness/fatigue, anxiety/discomfort, dependence on others and performing usual activities. The most frequently reported decline occurred within the 75-84 age group. The 65-74 age group reported the most difficulties with pain, muscle weakness, social activities and re-establishing everyday life. The 85-97 age groups reported the greatest difficulty with mobility, performing usual activities, re-establishing everyday life and anxiety/depression. The highest self-reported decline occurred in the two oldest age groups. Among the risk factors leading to failure to regain previous functions of everyday life, post-fall syndrome and activity avoidance is crucial [17,23]. Limited research has been conducted regarding whether domestic life and participation in community and social life changes after a hip fracture [4]. Older people are now more likely to be “wealthier and healthier” compared to previous generations [24]. Sustaining a hip fracture is a sudden, traumatic event that may affect many aspects of life [21]. Synonymous with the post-fall syndrome, the low confidence reported in performing tasks in the IADL section of this study indicates that avoiding social activities could be a sign of the onset of deteriorating functions.

This study shows that 86 (45.7%) of participants reported having control over personal hygiene two to five days after surgery during the acute phase. Pain, muscle

weakness and mobility were reported as being the most severe, even though this differed between age groups. This indicates that the participants in this study felt frail and powerless during the period immediately after surgery. Allvin *et al.* [25] stated that post-operative recovery starts directly after surgery and extends beyond discharge. The goal is to return to pre-operative levels of independence [25]. According to the results of this study, the first step in the recovery process would be taking responsibility for one's personal hygiene.

Over the past decades, the role of nursing has predominantly consisted of "delegated tasks" delivered by other members of the ward team. Registered nurses (RN) experience challenges in meeting individuals' fundamental care needs [26,27]. Emphasizing patient involvement by referring to this study highlights that recovery after a hip fracture is unique to each individual and the way that this is planned has an influence on patients' outcomes. Strengthening patients' self-efficacy at an early stage after surgery may be advantageous in their further recovery process and older adults may profit from a person-centered healthcare approach that provides healthcare in a manner consistent with the person's beliefs and values. Therefore, patients should participate in healthcare decision-making [12].

At four months, nausea, appetite changes, sleeping difficulties, personal grooming and interest in surroundings were areas reported as highly improved (80%-90%). Good health is individual and the experience of health is a balance between the individual's attitude and their ability to act with social support in the purpose of fulfilling meaningful goals. Good health is an interaction between bodily functions and contextual factors [28]. Healthcare needs and preferences from patient-reported outcomes have the potential to develop the Swedish National Hip Fracture Register. The definition of "good outcome" measured in terms of clinical outcomes and patient-reported outcomes will provide the opportunity to develop appropriate healthcare systems that will ultimately have an impact on patients' lives [12]. It should be considered that the results of our study probably underestimate the impact of hip fractures on the health-related quality of life on older adults. This is because our sample contained the healthiest and least impaired adults before their hip fracture. Furthermore, this group of older adults may have higher demands of everyday life.

Conclusion

Patients sustaining a hip fracture are heterogeneous and this heterogeneity will affect the recovery process, with different age groups experiencing different challenges in mobility. At four months follow-up, one fifth of the participants reported themselves fully or almost fully recovered and most of them had returned to their own homes. The PRP showed that participants had regained the ability to perform personal hygiene, dressing and in

nutritional intake. Declined mobility resulted in the need for walking aids, limitations in performing social outdoors activities and difficulties in re-establishing everyday life. The Swedish National Hip Fracture Register and the patient-reported questionnaires used in this study are appropriate tools to audit further development of healthcare to improve quality of life after hip fracture surgery.

Acknowledgements and Conflicts of Interest

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Paper IV





Sustaining a hip fracture is a common consequence of falls by older people. This sudden traumatic event can have substantial impact on previous healthy older adults' abilities to re-establish everyday life. They should have the potential to recover, but in Sweden about 40 percent do not regain previous abilities, function, and health related quality of life. This thesis focus on patients' experiences of the recovery process after hip fracture surgery. Patient-reported outcomes could be useful to improve clinical practice for those who are not disabled at the time of the hip fracture to maintain independency.