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NURSING AND CARING: EFFECTIVE FALL DETECTION AMONG SENIOR CITIZENS LIVING AT HOME.

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Abstract

Falls are common in older people and can cause significant health problems. The Western European area, which includes Norway, has one of the highest fall-related injury and mortality rates among older adults in the world. With a death rate of 2.8 percent and a case fatality rate (CFR) of 0.008, Norway is ranked second. This study describes nurses' and nurse assistants' perception of barriers in facilitating effective fall detection among older adults living at home. The research adopted the descriptive design and qualitative data collection to collect information from nurses and nurse assistants. Structured interviews were used to gather information and narratives developed from participants' responses. Based on the findings the study reveals that nurses poses professional knowledge that cannot be generated from evidence-based research. By providing insights into the perception of nurses and nurse assistants in relation to fall prevention, this study can contribute to development of solutions from nurses' professional knowledge that can be used for future fall prevention programs.

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List of Abbreviations

CFR	Case Fatality Rate
DALYs	Disability-adjusted life years
GBD	Global Disease Burden
POMA	Performance-Oriented Mobility Assessment
TUG	Time-Up and Go
WHO	World Health Organization

Chapter 1: Introduction

Background

Despite available knowledge and guidelines, clinical practice has generally ignored the detection and treatment of elderly patients at high risk of falling (source). According to WHO global report (2008), people over 65 years of age registered 28% to 38% fall incidences. This proportion is said to increase with age and level of fragility. Approximately 40% of the elderly living in care homes experience recurrent falls, and the economic impacts are critical (WHO, 2008). Globally, falling down is the second leading cause of injury death and accounts for over 17 million DALYs (disability-adjusted life years) lost (WHO, 2018). About 10% and 20% of elderly falls result in severe injuries such as fractures or head traumas (Chou et al., 2006). This indicates the burden fall has on older adults and therefore the need to understand challenges nurse face while taking care of this demographic. I am set to understand the problem of falling in Norwegian society and I have used nurses and nurse assistants to gather information on human relations and professional knowledge to relate how nurses use caring as a method of fall detection.

According to the World Health Organization (2008), the act of falling down is defined as inadvertently coming to rest on the ground, floor or other lower level, without any intentional change in position to rest on furniture, walls, or other objects. In order to prevent this problem, the study has sought to understand the challenges faced by nurses and nurse assistants while providing home based care to older adults who are prone to falls. In their daily routine nursing care, they can easily identify problems which hinder timely fall detection and prevention hence their professional knowledge can be used as an additional to fall prevention solutions. Falls are the major cause of injury-related referrals to emergency rooms and the main cause of accidental deaths in people over 65 years old. Fall mortality rates rise rapidly with age in both sexes and across all racial and ethnic groupings, with falls accounting for 70% of all accidental deaths among people 75 and older (Danielsen et al., 2016). Falls are commonly connected with severe morbidity and can be indicators of poor health and diminishing function. Falling causes more than 90% of hip fractures, with the majority of these fractures happening in people over the age of 70. Every year, one-third of community-dwelling older people and 60% of nursing home patients die (Wenger et al., 2003). A fall risk assessment is a procedure that determines the likelihood of a potential fall

for 6–12 months. The fall risk assessment tool is useful worldwide for nurses and nurse assistants in identification of older adults at risk of falling. For instance, while visiting patients at home the risk assessment tool is used by nurse in assessing environmental risk. It is also used to assess the suitability of a patient to receive care while at home. Fall risk prevention deals with the crucial issue of preventing falls from occurring in the first place (Danielsen et al., 2016). Medical personnel undertaking an evaluation of a patient at risk of falling should focus on history, medication use, postural control tests, and general physical function. Different research findings have indicated that these factors are contributors to fall among old adults. Determining and addressing the underlying cause/risk of fall is believed to help in rehabilitating patients allowing them to return to a functional state from temporary disability resulting from falling and thus reduce the risk of recurrent falls (Fuller, 2000).

For senior citizens that live at home, close to half of the falls occur close to or inside the house (Campbell et al., 1990), with women falling more frequently in the kitchen while men tend to fall in the garden (Lord et al., 1993). When these falls occur the patients need support from nurses and nurse assistants who visit them at home to ensure they are recovering well. Injuries resulting from falls lead to reduced social participation as older adults become incapacitated (Pin & Spini, 2016). Non-fatal falls are linked to significant morbidity, including reduced functioning and loss of independence. As a result, involvement of family member for social support is vital in the recovery process. Nurses play a critical role in training family member to look after fall patients while recovering at home. By involving nurses many of these falls can be prevented since they have the professional understanding of fall risk assessment and the interpersonal skills of attending to patients under recovery.

Nurses have been trained to use different technologies in assessing risk for falling among older adults. Some of the techniques nurses have employed to solve the fall detection issue include; accelerometers, and computationally intensive algorithms. However, nurses have faced challenges in using such technology due to two reasons: Firstly, the algorithms used in fall detection sometimes are not accurate because the environment where they are tested are different from human body. Secondly, some of this technology is expensive and might not be readily available for use by nurses attending to fall patients. However, developing a reliable fall detection system needs the commitment to fully understand why recurrent falls still occur (Abbate, 2010).

Qualitative analysis of perception of health care providers who use these systems of fall detection is instrumental in providing in-depth understanding of user case. In a study by Oliver et al., 2009 nurses were able to detect when a patient was at high risk of falling simply by watching them walk about and examining their medical records. Increasing age, medication use, cognitive impairment, and sensory deficiencies are all risk factors for falls in the elderly. A focused history with an emphasis on medications, a directed physical examination, and simple tests of postural control and overall physical performance are all part of an outpatient evaluation of a patient who has fallen. Understanding the perception of health care provides on hurdles faced in treatment and prevention of fall can help in generating knowledge useful for developing fall prevention strategies (Wenger et al., 2003). Other strategies identified by nurses to reduce falling include changes in the elderly's living environment, providing education to older adults on fall prevention, appropriate diet and prescriptions modified based on these tests are also useful strategies (Oliver et al., 2009).

Safety entails attitudes, values, perceptions, competencies, and behavior patterns of an individual or group (Bishop et al., 2016). Individual beliefs and institutional culture can influence health care providers' attitude, perception and behavior patterns which act as facilitators or barriers to fall prevention. Older adults may be resistant to call for help after falling due to fear of losing their independence (Laing et al., 2011). Falls have negative connotations, and the elderly may fear embarrassment, loss of dignity, and damage to their confidence. For this reason, I set out to understand the interpersonal issues and compromises nurses make in order to provide adequate care to older adults while factoring patient autonomy. hence the need to address nurses individual beliefs (Hughes et al., 2008). Another study on nurses' perceptions of implementing fall prevention interventions indicates that nurses perceive identification of patient-specific fall risk intervention can help in improving fall prevention strategies (Wilson et al., 2016). Since nurses have daily contact with fall patients while doing home follow ups, they are best suited to identify challenges which are not evidence based and propose solutions using their professional knowledge that can prevent future falls.

The Western European area, which includes Norway, has one of the highest fall-related injury and mortality rates among older adults in the world. With a death rate of 2.8 percent and a case fatality rate (CFR) of 0.008, Norway is ranked second (Haagsma et al., 2020). The statistics indicate that fall among older adults is of public health interest in Norway. Investing in enough health care

providers to attend to fall patients is required since human resource has been identified as a challenge in fall prevention. Assessment, reduction of risk factors, exercise, modification of the environment, and education approaches have been shown to affect fall prevention (Rubenstein, 2006) substantially. In other words, prevention of falls should be comprehensive, research and public health initiatives should be prioritized to define burden further, explore different risk factors and utilize adequate prevention strategies. Health care providers should also be trained on evidence-based strategies to reduce risk factors (WHO, 2018). Furthermore, we should discuss nursing profession knowledge on fall detection because it could be better than evidence based knowledge. Nurses provide daily care so are in better contact with the elderly and can easily identify some gaps/problems other than what is written on instruction manuals etc. and this professional knowledge can be used as an additional to sociology analysis.

Relevance of the study

Falling is a technical issue but also an interpersonal issue. I want to understand the nurses' reality on how they make compromises to ensure older adults don't fall. I used the theory of caring to understand the perception of nurses and nurse assistants. I have used nurses and nurse assistants because they are involved in management of older adults and possess the professional experience. Different findings have indicated by understanding health care providers' perception interventions to improve quality of care can be developed (Wenger et al., 2003). The theory of care emphasizes the need to handle patients with dignity and that includes patient autonomy. Nurses have indicated that patient refuse certain procedures that are prescribed to prevent future falls and this occur mostly, when nurses are dealing with new patients. Previous studies in Norway indicate that patient autonomy is taken before patient safety, which gives the patients the right to accept or deny care offered no matter how helpful it would be, for example, a procedure aimed at fall prevention. Patient autonomy influences the range and option of services a nurse can provide to patients while doing home visits. My study set out to understand the experience of nurses while prescribing fall prevention procedure and interventions to older adults with fall history (Berland et al., 2012). There is limited research that outline the perception of nurses and nurse assistants in fall detection and prevention. When nurses share their professional aspects, we are able to gather information that can contribute towards effective detection and prevention of falls among the elderly. This study has talked to several nurses and nurse assistants to gather knowledge on sociological aspects

of fall detection and prevention. In my material, I will refer to the nurses as a shorthand for both professions. The term older adults will be used interchangeably with senior citizens.

Previous Research

The act of falling down is caused by several interconnected predisposing and precipitating factors. As a result, it is understandable that nursing staff might be concerned about acquiring appropriate awareness and management skills in fall prevention (Haagsma et al., 2013). Even though the incidence of differing predisposing or precipitating factors varies by the population of older people (for example, dementia is a more common risk factor in nursing homes than in the community), essential facts about falls remain the same regardless of the environment (Danielsen et al., 2016). Understanding health care provider prevention awareness, mindset, and practices are critical for improving quality of care provided by nurses and nurse assistants This study sought to obtain information about fall detection and prevention among nurses and nurse assistants in the context of Norway. This information is valuable since it can help in coming up with solutions to falls among the senior citizens which is prevalent in Norway.

Several studies in the Western European region have looked at the prevalence, mortality, and disease burden of falls among older adults. *Falls in older adults in 22 European countries: prevalence, mortality, and disease burden from 1990 to 2017 by Haagsma et al., 2020* are some of the most recent and notable contributions to this information field. The research project's goal was to provide insight into differences in fall-related injury rates between countries, which can serve as an essential input for identifying effective prevention strategies. Findings from Haagsma et al include:

In terms of incidence, mortality, and disability-adjusted life years (DALYs), fall-related injury rates in older adults vary greatly by Western European nations. According to Haagsma et al., 2020, Norway is ranked number two out twenty-two Western European countries. Where 2.8% of total deaths is the relative contribution of falls deaths to the total deaths of all causes in the population aged 70 years and older. This is a clear indication that fall among the older adults is a challenge in Norway compared to most Western European countries. There was a fivefold gap in death rates between the countries with the lowest and highest fall-related injury death rates (Haagsma et al., 2020). There was a twofold disparity in incidence and DALY rates between the countries with the highest and lowest rates. Another study, the global disease burden (GBD 2017) study found that

the rates of fall-related death and injury in older adults are higher than those recorded in previous studies (Majdan et al., 2015). The more comprehensive age ranges included in the previously published studies could explain the differences in incidence and mortality rates. Since the incidence and mortality rates of falls in older adults typically increase with age, the research was limited to people aged 70 and up rather than 60 or 65, resulting in higher incidence and mortality rates (Haagsma et al., 2020). Future knowledge and resources deemed necessary to fulfill the effective fall prevention and detection techniques are constantly required. A new line of relevant research concentrating on the experiences of nurses and nurse assistants can bring fresh insights into knowledge gaps and alternative solutions for improve services offered to fall patients. Everyday life experiences and adjustment tactics used by nurses and nurse assistants may be valuable for other health care workers in overcoming barriers to fall prevention and detection.

Another possibility for the disparity in occurrence rates is how cases were defined in the different countries. In most research, occurrence rates of cases admitted to hospitals were recorded, while the GBD study included issues that required some healthcare in a system (Haagsma et al., 2020). This involves patients who were taken to the emergency room after suffering injuries resulting from a fall. Belgian research that included primary care visits and emergency room visits to evaluate the frequency of fall-related injury in older adults found fall injury rates close to the GBD (Boffin et al., 2014).

In 2016, another study in Norway titled *Increasing fall risk awareness using wearables: A fall risk awareness protocol*, Danielsen et al., 2016 stated the following:

Functional assessments such as Time-Up and Go (TUG), Performance-Oriented Mobility Assessment (POMA) (Danielsen et al., 2016), and others are objective and commonly used in clinical settings to assess fall risk. The Timed Up and Go (TUG) test is used in patients who have had a stroke to assess functional ability and fall risk. The duration required to make the transitional action from sitting to standing position, walk 3 m, turn around, walk back 3 m, and sit down in a chair is captured by the TUG. The TUG monitors timed walking and addresses functions particular to walking balance (Flansbjer et al., 2005). Norwegian nurses use these techniques while assessing patients for fall. They are not as the professional knowledge nurses have gained over years of observing and working directly with fall patients. Tinetti Performance-Oriented Mobility Assessment (POMA) is a balancing tool with both a balance and a gait component that was

originally created for use in the institutionalized, older adult population. The balance component of the test evaluates the patient's ability to maintain postural control while sitting statically, rising from a chair, and during the interval immediately after standing (Harada et al., 1995). They do not, however, account for a reasonably healthy population's responsiveness and discriminative capacity. In terms of fall risk assessment precision, none of these methods is adequate (Lee et al., 2013). Furthermore, clinical fall risk assessment methods ignore hazards present in the elderly's regular everyday living environment, such as carpets, pets, and doorsteps, explaining why clinical assessments struggle to differentiate fallers from non-fallers with a satisfactory identification percentage (Howcroft et al., 2013). These factors are well understood by nurse because they experience the challenges while following up on patients in their home. Nurses are able to identify factors that contribute to fall within an old person's environment. It is therefore important to harness this knowledge from their perspective.

Finally, the Hawthorne effect (Verghese et al., 2009), which describes people's propensity to perform better than usual when they are aware that they are being watched, may impact data collected in a clinic. Although prospective approaches concentrate on long-term fall risk assessment and prevention, few guidelines consider the current situation, while pre-impact fall warning systems to minimize fall-related injuries are available (Li et al., 2016). Falls occur at various times and in particular circumstances. The current context, such as time of day, current health status, location, movement, and other relevant information from the present context, must also be included in the fall risk assessment to avoid falls. As a result, fall risk assessment has a context-aware property affected by the current situation, which the existing literature has not sufficiently discussed (Danielsen et al.., 2016). The research described above have focused on clinical assessments based on health facilities leaving out home-based factors. My research fills the knowledge gap by focusing on health care providers' perception on barriers to prevention and detection of fall among older adults living at home. The focus is on nurses' experience because nurses' knowledge is sometimes 'devalued' in relation to evidence based knowledge in different models used in managing fall patients.

A Systematic Review of the Effect of Home Modification and Fall Prevention Programs on Falls and the Performance of Community-Dwelling Older Adults by Chase et al., 2012 indicated the following findings:

Nurses are involved in facilitating exercise through individual and group meetings; education about strategies to remain healthy and independent; guidelines for assistive technology and home modifications (Campbell et al., 2005). This study found that when these strategies are used together, they can effectively reduce the number of falls, reduce fear of falling, and preserve independence in community-dwelling older adults (Chase et al., 2012). The evidence that physical activity and home modifications minimize falls and maintain and encourage ADL and IADL efficiency is moderate when these measures are delivered individually. According to the data, person and multifactorial approaches seem to minimize risks of falling the subgroup of regular fallers (Nikolaus et al., 2003). Furthermore, people who adhered to a physical activity program recommended by nurses had lower rate of falls at follow-up than those who did not stick to the schedule well (Campbell et al., 2005).

Nurses offer client-centered and occupation-based interventions for older adults, however occupational therapy professionals are specialists in this field (Arbesman et al., 2001). Furthermore, nursing professionals understand that the physical and psychological advantages of retaining independence must be balanced against the risk of physical harm if a fall occurs (Arbesman et al., 2001). Pighills et al. (2011) stressed the importance of nurses for home-based dwelling older adults, reporting that adherence to recommendations improved their quality of life. In this study we talked to nurses and nurse assistants to understand their professional knowledge in managing older adults at home. The major goal was to learn about their firsthand experience working with older adults at home and how they feel about existing fall detection and prevention measures.

Research Aim and Questions

This research project seeks to address the following objectives, based on input from the nurses in my material

1. To explore the challenges encountered when carrying outfall prevention procedures.
2. To describe factors hindering effective use of fall assessment tools

The first argument would focus on the difficulties that practitioners face while performing out fall prevention procedures. The Second looks for variables that make it challenging to use evaluation methods effectively and the difficulties that may arise when using fall detection equipment, from the nurses' point of view.

This research aims to investigate nurses' and nurse assistants' perceptions on fall prevention procedure and the challenges they face when utilizing such procedures.

Chapter 2: Constructing a Framework Based on Previous Research

I constructed a theoretical framework that would help me in understanding nurses' views of fall prevention models because their professional knowledge is essential to finding workable solutions. Different models such as medication control, vision screening, fitness or physical activity services, home improvements, and education are among the strategies used by nurses in management of fall patients and reducing future falls. Nurses play a critical role in assisting older adults who want to stay healthy in their homes while still being linked to their families. Nurses do this through daily follow ups to patients at their home to see progress and manage any challenges that might arise. Since nurses are required to visit several households within a day, they sometime rush and do not give quality attention to patients. The scenario is different with patients who are in institutions where nurses are within the facility and easily accessible to patients when need arises.

From my conversation with nurses, they indicated that some of their roles include providing home visits before discharge from a health facility center and provide follow ups to ensure that patients are adhering to the guidelines provided for fall prevention. During home visits nurses and nurse assistants provide home evaluations with recommendations for home hazard reduction, home modifications, education on the use of assistive technology and modified techniques, and training in fall prevention strategies related to physical activities to improve strength. According to Steultjens et al. (2004), home-based care provides client centered services and build relationships aimed at assisting community-dwelling older adults in maintaining their independence and protection. Reviewing the most up-to-date research on various fall prevention and home modification techniques can help occupational therapists make better practice choices and have consequences for education and science. This systematic research review demonstrates the critical role of nurses and nurse assistants who work with older adults. In my conversation with nurses, I

was able to identify some of the challenges they experience while doing follow ups and home visit for fall patients. The knowledge generated will be valuable in guiding process for improving services offered by nurses during home visit.

Theoretical framework

This section discusses the theoretical framework that was utilized to construct and analyze the study's key objectives. The section introduces the concept of nursing care and the perception of nurses and nurse assistants working when providing care for fallers at home. Health care personnel face challenges that can have an impact on their work performance and, consequently health outcomes of their clients. They have direct contact with persons who need or are receivers of fall prevention interventions. The section explores the following factors of nursing care: caring, education, research learning and human dignity. Falls are caused by a number of interconnected predisposing and triggering variables. As a result, it's normal that nursing staff could be concerned about acquiring enough knowledge and management abilities in fall prevention.

Caring

Nursing is based on the principle of caring (Palese et al., 2011). Caring entails looking after and caring for patients (Pajnkihar, 2003). Watson's philosophy on nursing care provides a foundational philosophy that guides nursing practice by emphasizing caring as fundamental to patient's experience. Falls can have a significant impact on a patient's level of functioning and quality of life. Despite fall being serious public health challenge, nurses have mentioned lack of equipment and use of obsolete methods as a major concern. Nurses play an important role in fall prevention as patient educators. However, challenges still exist where there is no clear guideline for nurses to provide standardized care for fall patients.

Many evidenced-based research findings do not reach nurses as frontline workers with experience working with fall patients and largely ignore their contribution in decision making. Beyond the adoption of evidence-based approach in fall prevention. There is need for inclusion of the voices of nurses as professionals with direct contact with fall patients to improve patient outcomes. Nurses require creative and scientific skills and expertise to perform caring actions (Pajnkihar, 2008).

Nursing education is critical in acquiring and developing caring characteristics (Labrague et al., 2015). This is something that should be stressed during their careers (Pajnkihar, 2003). Considering that nurses work with fragile patients who require a lot of attention and understanding. For instance, as noted by some of the nurses I spoke to; predisposing condition such as dementia are prevalent among fall patients. This posses a challenge to nurses where patient forget to follow the guidance provided to prevent fall. Kumar et al., 2013 believed nursing activity is more than just the success of healthcare organizations (Kumar et al., 2013) or a particular type of professional and human-to-human interaction. Still, caring behavior can lead to patient satisfaction and well-being. Non-caring effects and frustration resulting from poor perception of health care providers on available fall prevention strategies do have negative implication on the health outcome of older adults. Therefore, understanding perception of nurses and nurse assistants is vital in creating a healthy environment for healing as indicated in the caring theory. The other component of nursing care as described by Watson, 2008, is teaching and learning to address individual needs. I talked to nurses and nurse assistants and they indicated that education can be used to promote fall prevention. Nurses in the study proposed to provide safety education to patient to help educate patients and families about fall prevention during home stays. Nurses in the study also intimated that fall prevention strategies should be client-centered and address individual needs of a patient. Therefore, understanding challenges nurses go through while teaching home safety as a fall prevention strategy is critical for improving quality of care provided by nurses and nurse assistants as well as for the safety of the clients they serve (Pearlman & Saakvitne, 1995).

Care is a critical component of nursing work. The research work demonstrated how care helps in improving health outcomes for older adults. Key elements discussed with the participants was on building trust and relationships with new patients. It was noted that without good rapport, some of the patients refuse advice provided by nurses. As result, there are poor health outcomes and reduced care for patients by not giving the full attainable health services. The section after this, reviews the professional knowledge generated by nurses and nurse assistants and how this knowledge can be utilized for the wellbeing of fall patients.

Knowledge generation

This research sought to examine the experience of nurses and nurse assistants in fall prevention. I examined challenges nurses and nurse assistants experience while using fall prevention

procedures. They also provided their experiences in using different fall prevention and detection techniques. New techniques and technology are being generated about fall prevention hence understanding how nurses and nurse assistants are adopting to these changes is critical in improving quality of services offered to fall patients (Pajnkihar, 2003). Regular evaluations of nurses' caring behavior, and actions can aid nursing administration in planning needed practice improvements. I decided to investigate these relationships because there is limited research relating to nurses' perception about challenges they face will providing care to fall patients at home. Nurses firsthand experience from daily interaction with fall patients is critical in bridging the knowledge gap between evidence-based research and professional knowledge experience.

The nursing care theoretical framework proposed by Watson explored the role of knowledge generation and problem solving as a component of nursing care. He postulated that caring must be practiced and researched (Watson, 2009) since lack of caring is a significant challenge to healthcare quality. I used this theoretical framework to draw interpretations based on nurse and nurse assistants own experiences. The process involving self-reflection on our experiences and stimulation of the analysis and reformulation of our actions.

Most research has focused on generating evidence-based data forgetting the qualitative aspects of knowledge generated professional directly involved in managing fall patients. This research often does not provide feedback mechanism with implementers. Consequently, there is mismatch between evidence generated and actual implementation. This qualitative inquiry will generate professional knowledge as shared by nurses and nurse assistants. The section below covers another key component in nursing care especially when working with vulnerable populations.

Human dignity

I talked to nurses and nurse assistants to gather their views on challenges experienced while providing care at home to older adults with fall experience. I discussed with them how they manage cases in the context of caring for older adults and the factors that promote or hinder quality service provision. In my inquiry, I wanted to account of the nurse’s professional knowledge in fall detection and prevention that is not evidence-based and thus often overlooked in literature. Through this research, I hope to add to qualitative insights into the problem of geriatric falling down challenges. I used the narratives provided by nurses and nurse assistants in understanding

the role of human dignity in caring for fall patients. The nurses in the study described their cardinal responsibility while providing care to older adults with fall experience is to ensure the patient feels dignified. This they do by allowing patient autonomy while prescribing management procedures. Watson defines human dignity as being cared for and being treated with respect even when sick (Watson et al., 2010). Nurses in our study espoused the ideal mentioned by Watson in his nursing care theory. The theory describes caring as the moral ideal of nursing in which the end goal is to protect, improve, and preserve human dignity." (Watson, 1999). Interpersonal relationships that are based on trust and integrity are critical for maintaining human dignity (Pajnkihar, 2003). In my interview with nurses, they described the critical role of building relationship with patients especially when visiting them for the first time. Eriksson coined the term "carative" in the field of caring research, defining it as "love and charity, as well as the motivation to care for all" (Eriksson, 2006). This motivation is what drives nurses and nurse assistants in our research as they provide services to patients with fall history.

Chapter 3: Methods

In This section I lay out the research project's conceptual nature and systematic framework. The study's research approach is qualitative in nature. The aim is to collect, analyze, interpret, and present data from semi-structured interviews that are descriptive and reflective of experiences. Experiences from nurses and nurse assistants are useful in understanding challenges they face while delivering care and identify possible solutions to these challenges. To draw out reflections and descriptions, I used descriptive categories outlined in Social Research Methods by Alan Bryman. He identifies three descriptive categories that are generally characteristic of qualitative research, which he calls: inductive, epistemological, and ontological (showing the relations between the concepts and categories in a subject area or domain). I briefly explain how this project design falls into these three descriptive categories. Rather than forming a hypothesis and deductively confirming or disproving it by analysis, an inductive approach was used, focusing on gathering data and reviewing those findings based on distinct justified beliefs before making connections and speculations.

The focus of this research is primarily based on the perceptions and interpretations of nurses and nurse assistants in the context of providing care to the elderly, reflecting the epistemological trend in qualitative studies where "the stress is on the perception of the social environment through an analysis of the interpretation of that world by its participants" (Bryman, 2012). Nurses have experience working with patients with fall history and understanding their professional knowledge is key in development of solution to prevent future falls.

Finally, my approach to conducting this study was based on constructionist principles, which assume that collecting narratives of experience within society and its institutions is critical to understanding the perception of those involved. In this case, I collected narratives from nurses and nurse assistants' hands on knowledge about falling down among older adults. This is because most literature excludes the personal experiences or understandings of nurses and nurse assistants. As a result, the procedures involved in prevention and detection of fall cannot be fully utilized for care of older adults.

The participants were interviewed one-on-one in semi-structured interviews as part of the study's analytical approach to data collection. The decision to use semi-structured interviews as a data collection format was influenced by and derived from the frameworks used by Bjrnholt and Stefansen in the EFFECT project studies (Bjørnholt et al., 2017). This is the utilization of qualitative methods in application to sociological analysis.

In my own study, I have included nurses and nursing assistants who live in Norway and work with senior citizens living at home. The choice of using nurses and nurse assistants working with senior citizens living at home allowed data collection from the experience of health care providers working directly with senior citizens in fall detection and prevention. Among the findings, I draw from my material, I was able to note challenges in staffing and use of outdated techniques in fall management. Underlying conditions also formed part of the major discussion among most nurses.

Access and Recruiting informants

The study population consisted of senior citizens' caregivers (licensed nurses and nursing assistants). I used a non-probability sample where I selected participants subjectively rather than randomly. I included nurses and nurse assistant with more than two years of experience providing home based care to senior citizens. This category of health care providers working with elderly have primary idea/ education on senior citizens' care. The nurses and nurse assistants also had proficiency in english as it was the mode of interviewing. Nurses and nurse assistants not working with older adults with history of fall did not form part of the study. This is because they would not have valuable experience to share in understanding perspective of nurses and nurse assistants in fall management. Those who have not managed patients at home were also not included since I was interested in understanding fall management at home. This is because nurses working directly with fall patients have hand on experience. On the other hand, a nurse with no experience may understand nursing care theory but might not have insights nurses face during home visits.

After making initial contact with a potential informant and providing them with a brief overview of the project, the participants received a phone call or face-to-face discussion with a more comprehensive and thorough description of the research as well as a written invitation to participate. My participants received the information in english; the consent form is available in the appendix. It informs the participants that they have been invited to participate in a research

project. It also indicates the approximate time the interview takes. The interviews were conducted in english and explored the experience of nurses and nurse assistants experience caring for the elderly to prevent falls. All the participants selected had proficiency in English for ease of communication. However, some terms could not be communicated in English and had to be translated. Consequently, this could have altered some of the meaning in the process. Some of the interviews were conducted via phone hence the participants were not able to give detailed response due to time constrains and consequently, we were not able to draw much from their experience. The consent form also provided background information about fall prevention and detection procedures and clarified that the discussion aims to learn about nurses' experiences caring for senior citizens.

The information letter informs potential participants about their rights as research participants. Specifically, I used de-identified interviews and used codes to ensure identity of participants remained anonymous and that their identities were concealed. There were four Registered Nurses and two Nurse Assistants. Two of the participants were between ages 40-50, two between ages 20-30 and two between ages 30-40. They consisted of two males and three females. All these participants provide home based care to senior citizens. For confidentiality, I gave my participants pseudo names. Stian, Peter and Ben, were pseudo names given to male participants; Rita, Maya and Lana were pseudo names given to female participants. Rita, Ben, Maya, and Lana were Registered Nurses whereas Stian and Peter were Nurse Assistants. All the participants had a working experience of more than two years; Stian (13years), Rita (6 years), Peter (10 years), Ben (9 years), Maya (5years) and Lana (4years) experience. They all work in the same municipality.

Participants had the option of withdrawing from the interview at any point of the interviewing process. All relevant points of contact were included in the information letter if they have any questions or concerns. I also provided my participants with a consent form to read and sign before we started the interviews.

Sampling method

Purposeful sampling is a qualitative technique for identifying and selecting information with deeper understanding of a subject to make the most efficient use of limited resources. This entails locating and choosing individuals or groups of individuals who are particularly informed or experienced about a topic of interest (Cresswell et al., 2011). In addition to expertise and

experience, Bernard (2002) emphasizes the importance of availability and willingness to participate and the capacity to articulate, convey, and focus on experiences and opinions. I interviewed nurses to generate professional knowledge that provided data for sociological aspects of fall detection and prevention. For the most part, qualitative approaches are designed to achieve depth of understanding, while quantitative methods are designed to achieve the breadth of understanding. Saturation (i.e., gaining a systematic experience by sampling before no new substantive knowledge is acquired) is emphasized heavily in qualitative methods (Patton, 2002). In my research, I selected nurses and nurse assistants working with senior citizens living at home since they are directly involved in providing care to senior citizens involved in fall accidents. Nurses have the professional knowledge to identify gaps and suggest solutions to challenges faced in fall prevention and detection procedures.

Challenges to use of purposeful sampling

The study focused only on nurses and nurse assistants from one district in Oslo municipality. This reduced the variation in responses from the participants. Including a wider geographic area would increase variation and the amount of data that can be collected. I also used one municipality as a representative of other municipalities in Norway because of the nature of the thesis which is qualitative and the limited time. In the qualitative methods area, to equate purposeful sampling with systematic sampling, one must have a justification for selecting research participants related to the investigation's goals by looking at qualifications they have to answer the study's objectives (Patton, 2002 & Palinkas et al., 2015).

Semi-structured Interview

I conducted semi-structured qualitative interviews with six distinct participants for this study. Five of the interviews were conducted face-to-face while one was conducted through phone call. Along the way, these front-line workers have learned that there is no way of generalizing cases, and building trust is a key component of successfully providing home based care to older aldults. Semi-structured interviews were useful in obtaining information from the participants. The semi-structured interviews focused on the participants' perceptions, worldviews, and personal feelings. By using semi-structured interviews, I hoped to allow participants to speak freely while maintaining control over the issue. According to Merriam and Tisdell (2016), there is no precise order for the questions in a semi structured interview. My interviewing process was relatively flexible, following the flow of a

conversation. In the interview process, I covered specific topics and gathered information without following a strict order but based on response from participants. The interview covered the following topics; activities contributing to patient falls; challenges in identifying elderly at risk of falls; problems experienced with fall prevention protocols; measures by health care workers to reduce fall incidences; challenges in using fall prevention equipment/tool and interventions for detecting/ preventing falls. Using the six themes I was able to draw perceptions of nurses and nurse assistants in relation to fall prevention and detection among senior citizens. The six themes were late used to discuss results. During the interview, I was able to deliver the questions in a different order based on each participant's distinct answer. Some of the challenges identified included; inadequate staffing, use of outdated procedures, management of fall patients with predisposing conditions and inadequate training. From the interview the participants identified poor lighting and bathroom as the major cause of fall. Even though the interviews were flexible in terms of question order and took varied courses depending on the participant, the questions provided structure and the research objectives stayed at the forefront of the dialogues.

Analytic strategies

My methodological approach to data processing for the study was broad thematic analysis. To familiarize myself with the content, I read through the transcribed interviews numerous times. I took notes and highlight them in the text as I read through printed copies of the material to begin organizing a system of preliminary codes for the content. I looked for broader trends and themes that linked the principles throughout the different interviews when analyzing the transcripts and doing the initial coding. One of the drawbacks of the coding process of interpretation is that longer pieces of the narrative are fragmented, resulting in reducing the meaning derived from the description in its entirety (Bryman, 2012). For this research, the method resulted in providing the general perception of nurses and nurse assistants on management of fall among older adults. Through the analysis I was able to draw themes on challenges and measures taken by nurses and nurse assistants while providing homebased care to older adults. Based on major themes, nurses identified challenges with using technology for identification of fall patient due to inaccuracy of equipment used. Environmental factors such as slippery floors were also a major challenged described by the participants. Nurses proposed continuous capacity development to ensure they

are updated in use of current techniques. In addition, they identified involvement of family member in management of fall patient as a strategy to improve health outcomes.

Study Limitations

For this study, I did six interviews with four nurses and two nurses assistants to gather their professional knowledge and understanding of challenges they face while attending to fall patients. All the participants had experience working with fall patient at home. The nurses provided perspective of their work with fall patients. However, one interview was conducted through phone and due to time constrains we were not able to gather adequate information on challenges. One of the participants had limited experience working with fall patients at home. The participant shared her experience but related more to her work in institutional homes. I hope future studies will put emphasis on generating more qualitative data based on professional knowledge of nurses and nurse assistants.

Another significant potential constraint in this project was language and translatability and the potential for meaning loss or change during that phase. Even though I am conversationally fluent in Norwegian, there were linguistic difficulties during the search for previous research done in Norwegian and records kept in Norwegian. There are some terminologies that I am unfamiliar with, which may necessitate more clarification to ensure there is no loss of meaning in translation. Another language-related limitation of this study was my lack of access to recent and current Norwegian research and documentation on the topic. Despite the fact that I have learned the language and have a good understanding of it, my academic abilities are lacking. Lastly, with the COVID-19 pandemic, it is necessary to have the appropriate personal protective equipment (PPE) when interviewing informants. Apart from PPE, it is advised to keep social distance, which might pose a challenge when conducting interviews.

Ethical Consideration

Since I collected data and personal information from my informants when conducting interviews, I got ethical clearance and approval from the Norwegian Centre for Research Data. The primary concerns in carrying out these aspects of the project was to maintain my informants' privacy and anonymity during their participation. Furthermore, it was crucial to ensure that those who

participated as informants were fully aware of their rights as informants in my study and that they were aware of their ability to withdraw voluntarily at any time. It is essential to exercise caution when collecting and storing personal information (Bryman, 2012). I ensured that raw data materials, such as transcripts of the interviews, were kept safe. I used computer-based equipment to record, archive, and sort my data through audio files and transcribed interviews password to access. When the documented interviews were transcribed into text documents, they were coded with pseudonyms, and any personal or private information that might disclose the informants' identities was changed. Other ethical considerations made during the creation of this project have to do with representation. Not harming the research subjects is one of the cornerstone concepts of social work and the social sciences (Bryman, 2012). This principle directed me throughout the project, from developing my interview guide and conceptualizing its content in a way that respects my informant population. The regulations were also valuable for arranging and conducting the interviews. It considered the informants as unique human beings and their time to participate in the study. Objectivity was observed to ensure as an investigator that my questions did not provoke, threaten, or hurt the participants; but give my humanity and attention as a researcher interested in their views and experiences; to my experience of data processing and analysis. During the research I ensured that the format of question did not require health care providers to disclose the identity of their patients. To preserve my informant's right to privacy, the stage of data collection and transcription necessitated professionalism and diligent measures to systematically archive and anonymize all personal data in interview transcripts. It's also worth noting that every study requires the researcher synthesis and interpret the data. It is crucial to maintain an ethical understanding of the subjects at the core of the research in this period and ensure that perceptions and analysis are not exploitative or harmful.

Chapter 4: Results and Analysis

In this part, I depict and analyze the perception of nurses and nurse assistants in relation to fall detection and prevention among senior citizens. The results are organized into six subsections, the first of which describes the activities and reasons contributing to patient falls. Participants were asked whether they have worked with fall patients at home or home-based care, and if yes, what were some of the factors contributing to fall among senior citizens in at home and home. The second subsection focuses on the challenges faced while trying to identify elderly at risk of falls. The next section described the problems experienced while dealing with fall prevention protocols, which were discussed in the second part of the interviews. Measures taken by health care providers to reduce fall incidences was gleaned from the fourth subsection of interviews. The next part depicts the challenges these nurses and nurse assistants faced while using fall prevention equipment/tools. This material was discussed further in the fifth segment of the interviews. The final portion discusses the possible interventions to detect and prevent falls activities. This information was discussed in the last sections of the interviews.

4.1 Activities contributing to patient falls

The experiences a person has in working with patients with fall history can be instrumental in determining their perception and ultimately how they work (Aras R. et al., 2012). Nurses and nurse assistants understand challenges they face while attending to fall patients. Therefore, understanding the perception of nurses and nurse assistants in prevention and detection of fall among older adults is critical in reducing the health burden of falling down problematics. All the six participants expressed their personal experiences as having worked with older adults with fall history in home-based care.

Stian observed that most falls occur at home due to limited space and that ability of patients to move is lowered by age and other reasons makes them to fall. Other issues noted by Stian included lack of follow-up, slippery floors and unstable shoes as greatest contributors of falls occurring at home. This finding was in agreement with other participants.

I would say Female gender are at high risk because they live longer and are prone to bone degradation. They fall mostly when moving to and from toilet.

Joshi et al. 2015 in their study noted that most falls occur in toilets and bathrooms without grab bars. Going to the toilet was one of the major findings in my material. Rita who is a registered nurse with an experience of six years providing home based care had the following to share when asked about reasons contributing to fall.

Those living at home are more prone to falls due to different situations, for example they live alone. When going to the toilet some don't use the wheelchair and rulletool (walkers). They don't take precautions, sometimes there is no good lighting. Patients also fall when taking a bath or shower if floors are slippery.

Peter, a nurse assistant described his experience, he pointed out that Falls mostly occurred at home especially when getting out of bed, though he felt that is difficult to tell which gender falls most. ''There is no effect of gender on falls". This is contrary to what Stian had observed in his work with fall patients. For Stian, fall was rampant among women compared to men. In my literature review I did not come across findings that looked at fall from a gender lenses.

The participants also mentioned that older adults in nursing homes are more prone to falls because they are weaker and sicker than those living normal homes. They also pointed out that older adults fall while doing activities of daily living. This could be an indication of readily accessible staff to attend to patients, unlike normal homes where adults might be living alone. Ben had this to say;

They fall mostly while doing activities of daily living for example going to the bathroom, brushing teeth and others. Some fall next to their beds when trying to wake up because of hypotension, they also fall when making food in kitchen, and while in living room and bathroom. But falls in living room depends on the settings in the houses.

In summary, the activities contributing the most to fall as experienced by nurses include; Poor lighting which reduces visibility along the path used by older adults. Going to the bathroom and toilet also contributed significantly to falls as recorded by all the participants. Based on these findings as experienced by nurses, solutions that help reduce hazards around the house environment can be developed.

4.2 Challenges in identifying elderly at risk of falls

A person's professional background and profile are shaped by their experiences and learning along the process. It's less about the first cases and more about what a professional learns and how they approach a challenge during the transformational learning process (Gillespie et al.,2012). I interviewed participants who shared their experiences working with older adults. The nurse and nurse assistants outlined some of the challenges they face during their home visits. Their level of response and management of those cases outlined almost similar challenges among the six participants. They clarified the importance of building trust with the patients in order to provide successful assessment.

Maya made reference to her experience with first visit for new patients.

> *We have manuals that guide us on how to handle fall patients. Yes, we face challenges especially when sent to a user you don't know for the first time. It is important to talk to the user. It is also important to observe for bruises and ask questions if they ever experienced fall. Mostly, new ones are open, but if they don't know you, some patients will hold back information.*

In their experience working with older adults who have experienced fall, Participants also outlined the challenge of misconception and the feeling of invading personal space when handling such cases. They also felt that some patients were hesitant to give information about their fall history. Lana said;

We need to assess, evaluate, and implement. We give quality care. Some patients can have misconception on what you are asking and think you are intruding to their privacy; it also depends on how they comprehend the questions you ask. When the patients feel the questions are too personal, they are hesitant to answer.

The relevance the assessing patient at risk of falling was highlighted by participants, who expressed the challenges they experience when identifying patients at risk of falling. This information helped in understanding the work of nurse and nurse assistants. Working with people and, more specifically, with older persons with history of fall, is not an easy task. An individual evaluation of the patients and the case is crucial. Two of the participants expresses similar outcomes from assessing patients at risk of falling. The perspectives of nurses and nurse assistants is important in gaining understanding the best approach to addressing challenges that occur during identification of patients at risk of falling.

4.3 Problems experienced with fall prevention protocols

A further aspect of fall prevention is the problem of following fall prevention procedures and how it impacts the work of nurses and nurse assistants. These procedures include the different techniques and technologies for management of fall prevention. All the participants shared their experience in using the different fall prevention procedures and the challenges they face while implementing protocols in their everyday working life with patients. The participants shared the mismatch in the guidelines provided to them and their daily professional knowledge. For instance, the procedure did not provide clear guidelines when a patients need more visit than stipulated in the manuals.

Lack of recent knowledge, inadequate staff, and failure to adhere to some of the fall prevention procedures were some of the challenges pointed out by the participants; Ben shared the following based on his experience with fall prevention procedures.

Sometimes the Staff are not up to date with the fall prevention procedures. There are no enough staff to send two personnel to those patients. Patients ring the bell in order to get someone to follow them and sometimes you find that no one is responding to the bells hence try to do it on their own and fall. Staff also forgetting to give bells to the patients.

Similarly, Rita's story revealed that in most cases two staff are sent to attend to a patient. She observed that sometimes the workload is strenuous especially if a patient requires more than one visit. She added that this in most cases is also not economically viable. She had this to say;

> *The facility tries to send two personnel to the patient if needed, it's important but sometimes challenging, for example if the patient needs 5 visits in a day, it is economically draining.*

Another participant by the name Peter emphasized that two staff are always sent to assist patients who have fallen. He also mentioned that most of the fall prevention procedures are easy to follow. However, some of the patients refuse to be assisted. Later, He explained that some of the patients have other underlying conditions such as dementia which makes following the procedures difficult. He said;

> *The fall prevention procedures are easy to follow but some patients want to do it by themselves, some have dementia hence difficult to explain to them. Patients have self-determination and they can say no to the help you want to offer. For patients who are at risk of falling, we are always sent two staff and its mandatory, so we get solutions.*

Maya added;

> *Heavier patients are a problem I would consider not injuring myself…Well, some have assistive devices like 'staheis' (lifts for patients who can stand) which we use to help them up when they fall. We do get problems, we have two staff going for home visits, but some patients are too heavy and bedridden and need help to move them. Weight and the disease they suffer from can also be a challenge to the personnel. The number of Staff is also not enough to send two, they need to do something with that...*

Maya's remarks reflect on the inadequate staffing that attend to fall patients. There is no back up staff to support the recommended two staff when they run into challenges during follow up visits.

Lana also reported that they had difficulty when dealing with new patients for the first time. She expressed her challenges when communicating with older adults considering some are visually impaired and others might have hearing challenges. Lana further expressed her challenges getting updates on new fall prevention strategies and that some of the procedures are obsolete and therefore, do not meet the current needs of the patients. She conquered with other health care providers that indeed there is shortage of personnel to carter for older patients with history of fall. Lana had this to say;

> *We never get updated so often on fall prevention tactics and sometimes the procedures are not up to date that is; if no one updated the procedure according to current patient needs ...these elderly patients are sometimes not cooperative and may not accept every advice you give them...staff shortage is also a problem. ... when a patient is new to me, I experience a few problems. It is also not easy to communicate with the elderly, some can't hear or see properly.*

Majority of the participants indicated that there was shortage of personnel to attend to patients with fall history. The other challenge was on use of updated procedures when managing patients with fall history. For front-line workers, it is important to have up-to-date information and the most effective work tools, and to be properly trained. They consider that this is important, since they work with older adults some of which are fragile and need to be handled with utter most care and respectable manner. For these participants, shortage of staff and use of outdated procedures was a constant disadvantage in caring for older adults with fall history.

4.4 Measures by health care workers to reduce fall incidences

Each participant shared their different professional knowledge about the measure they take to prevent fall among their patients. Although the participants had different professional opinions, all of them addressed specific issues, such as; removal of obstacles that can cause danger to the patient; keenly observing patients with underlying conditions such as neurological disorders; observing patients under medication and any changes in their general health- and ensuring proper lighting. This specialized knowledge nurses possess, is usually not captured in manuals or

procedures based on 'evidence', which is a different kind of knowledge. In other words, nurses are instrumental in finding fall-proof measures and are therefore very important actors in addressing fall problems.

The actions taken by the nurses and nurse assistants, help patients in recovery to prevent future falls and improve the general health outcomes of such patients (Huang et al., 2005). Stian one of the nurse assistants stated;

> *Mostly the best thing I do is to remove obstacles that cause danger…mmmmm…and make sure shoes are compatible with floor, and also provide walking sticks.*

These insights from the daily active of nurses are critical in understanding the work done by nurses and nurse assistants. According to Peter, providing a suitable environment for patients such as giving walker and improving lighting helps reduce falls. Based on his experience, he uses these strategies with his patients as a measure for fall prevention. He said;

> *I give them walkers, good shoes, ensure good lighting in the house, talmodihet (patience), guide them on where they are going.*

In many cases, patients fall while trying to move from one spot to the other. When basic items the patients use are out of their reach, it increases the risk of them falling. Having at least two people attending to a patient also reduces the risk of further injuries as both work together to assist a patient. From the experience of Rita, she said,

> *Usually, we work two personnel together so that one can observe. I also ensure free path when going from bathroom to living room or kitchen, I can also bring what patients need closer to them. Some patients feel that they can manage on their own, but I try to explain to them that they can injure themselves and that I am there to help*.

Stian added,

> *Observe patient first because some have neurological problems hence, we have to work with them individually some have stroke and cardiac arrest, we cater to the needs of the patient. Others have hemiparesis and we need to know which part is weaker and which*

side they may fall from. For patients with Parkinson, we consider atrophied muscles and address their need but for patients without underlying conditions, removing barriers and obstacles that can cause fall is critical in prevention of fall among older adults. For those who do not suffer this we have to remove things that are stumbling blocks, for example; carpets but we need to talk to them before we take this action.

Due to predisposing conditions, patient autonomy or where patients stay alone; some of the recommendations to prevent fall are usually not adhered to. A nurse participant opined the importance of observing general health of the older adults which could affect mobility, she further mentioned the importance of observing patients on medication that cause drowsiness, reminding patients to ring bells, following up patients with dementia to the toilet and ensuring that supportive equipments are within patient's reach. This is what he had to say;

I observe any change in allmenstilstand (general health) of the patient that can affect the mobility, Patients on medication that cause more drowsiness should also be observed, I also remind patients that if they needed help, they can ring. Those patients with dementia should be followed to the toilet. I also check that hjelpemiddel (supportive equipment) are close to the patient and ensure its comfortable for them to come up.

Maya clarified that her personal experiences have led her to be more empathetic with patients in general. She has also noticed that some falls are inevitable and therefore, she ensures that the patients get safe landing.

When I visit the patient, I ensure that there is enough lighting, I also check the floor if it is slippery and ensure no loose rags…I also place walkers and walking sticks close to the patient. If the patient seems too heavy for me, I call the office to get extra person but sometimes there are few staff and it can take a while to get that extra person.

In general, majority of the participants indicated that ensuring safe environment among fall patients is vital in preventing future falls. However, these guidelines are not fully followed where patients stay alone or patients with conditions such as dementia. For nurse and nurse assistants, it is important to understand the individual needs of a patient. Patients with other conditions and

those on medication need extra attention to ensure their safety. Nurses are in unique positions to transmit this awareness to potential fall patients because they build trust through caring, which is a professional trait. This professional knowledge is thus more important than evidence-based knowledge and manuals to prevent this problematic.

4.5. Challenges in using fall prevention equipment/tool

Due to the changes and introduction of new equipment for management of fall nurses and nurse assistants have experience challenges using some of the equipment. All participants expressed that at some point they have experienced challenges while working with fall patients. They acknowledged that working with older adults with history of fall is not an easy task and that they dealt with difficult situations and delicate cases on daily basis. They reinforced what was mentioned early on difficulty of managing patients with underlying conditions and the need to update oneself with current knowledge on equipment for managing fall patients. Some of the equipment currently in use for management of fall mentioned by participants include; Canes, walkers, wheelchairs, elevated walkers (prekestol). Arbeidsstol (Working chair) where they sit when doing their activities of living, heis (lifts) for moving and lifting patients e.g., passive/ sail and active lifts.

Ben made the following statement:

> *Yes, challenges are there for example if personnel is unfamiliar with utilizing this equipment they can result to injuries., Welfare technology systems for example; devices with infrared cameras, give picture of what is happening, but they don't function as surveillance cameras, they only detect something is moving but do not give true information. They give false alarms, they are unable to detect if it is really a person moving or something else, they give alarms to wheelchairs or walkers thinking it's a person standing in front of them. This is from real life experience; a fall sensor didn't detect anything, and the patient died after lying long on the floor without getting help. The cameras being used are not coded and can't detect if it's a person or an equipment.*

As nurses monitoring patients and doing follow ups, it is tedious to respond to false response and consumes time that might be used to attend to other patients. There's need to update the system. He also added;

> *There are challenges from patient's side; The patient's problems/ diseases or symptoms, for example, those with stroke and hemiparesis can easily fall because other body parts are not functioning symmetrically, walking with one hand on a walker doesn't give enough security. Others have dementia and cognitive problem, so they don't comprehend where they are going to or how they are going to use the equipment. So, it depends on sickness and how weaker a person gets.*

Stian further explained, "Patients' autonomy: probably 20 % are skeptical, others don't want to use the fall protective equipment while others are not open to changes, we also need to respect patient's autonomy, but we need to explain to them the importance of these fall protective devices in fall prevention."

For one Maya, patient autonomy plays a critical role on the use of fall management/ prevention equipment.

> *Some patients are not willing to use them…maybe they feel stigmatized, and you can't force them. Incase an equipment is faulty, then it would be difficult to use it… most elderly patients have memory loss, and they will always forget the equipment even if I give them. I Sometimes get difficulties if an equipment is new for me and I do not know how to operate it well.*

Maya felt that Patients with dementia forget ...''They stand and go but for the ones with good memory there is no problem using supportive equipment." She made a point regarding her ability to use equipment, ''I am good at using supportive equipment, because as nurses we need to be effective. also, as a nurse one is supposed to guide and teach. Nurses should also contact physiotherapist concerning patients with poor mobility." And emphasized a problem with dementia patients. "because of dementia, some patients forget the walkers in the toilet. We also try to respect patients' rights, some will not accept the care we try to give, but we motivate and not force them." Other participants added that some older adults are in denial that they are unable to

walk again hence can't accept it. They felt that involving family in the management of dementia patients with fall experience is key in ensuring adherence to advice given by nurses. They further added that vulnerable elderly patients living alone can be managed in nursing homes, but their preference need to be taken into consideration.

On the other hand, some participants also reported that they had no difficulty with equipment used to manage patients after fall. Through experience they have mastered the use of fall management equipment. Peter said;

> *Personally, I am used to use this equipment. I don't face challenge not unless if they refuse to use the equipment which sometimes happens, but you have to remind them the importance of using this equipment.*

In summary nurses mentioned that dementia and patient autonomy play a critical role in management of older adults with fall history. Patients tend to forget the guidelines given to prevent fall while others refuse recommendation suggested by personnel. Since, most of the family members do not want to be involved in management of patients, they do not provide the necessary support in absence of nurses. The following sections will review some of the suggested solutions to detection and prevention of fall based on nurses' and nurse assistants' experience.

4.6. Interventions for detecting/ preventing falls

The Norwegian health facilities have taken numerous steps to control, prevent and reduce fall among older adults living at home. However, the expected results depend not only on the preventive measures that have been established, but also on the efficacy and work performance of those who manage the programs and those who work directly with the patients with fall history (Gürler et al., 2021). The participants gave their perceptions about working at home with older adults that had experienced fall. They provided information on the measure taken, what they believe is working and what is not.

Four participants stated that full assessment of patients at risk of falling is important and that necessary follow ups should be conducted. Rita opined, the need for individualized assessment for

each patient and improvement of assessment equipment to detect fall in different circumstance is vital. She said;

> *We do everything we can to adjust to every type of situations. It's usually individual on how we tackle situations. We try to tackle situations individually. There's need for proper fall assessment tools. Welfare technology should also help to make life better, we should have applications where we can detect falls or problems in different situations.*

Nurses want to be taken seriously as professionals with intimate knowledge of the problem faced by older adults with fall history. In addition, nurses want the technical equipment needed to take care of fall patients be readily available for quality care to be provided. Considering that Norway is ranked among top countries with high fatalities of fall. The following challenges described by Lana should be reviewed. Lana mentioned that;

> *Employ enough staff so that it is possible to send two of them to heavy patients and who can easily fall. The facility should also lay fall prevention procedures clearly and ensure that they are up to date.*

She explained that, among other factors, she had observed that enough time was not allocated to attend to patients. She later specified that in most cases, patients are attended to in hurry because there are several other patients to be attend to. "Enough time should be allocated for patients who are frail because sometimes you have little time with patient and yet you need to go to the next patient on time, so staff end up giving care in a hurry.'' She also mentioned that staff are often not up to date with some of prevention procedures and that there is need to ensure they are always updated. "The staff also need continuous updates on elderly falls prevention strategies." To her these updates, good assessment and collaboration with other institutions will ensure patients with fall history receive proper care. "Good assessment of new patients in order to identify fall risk on time... the facility should also ensure good connection with other institutions and health workers

for example doctors, physiotherapists, nutritionists among others for better multidisciplinary approach to patients." She concluded by requesting that fall assessment tools be readily available and that involvement of relative in caring for patients will help improve health outcomes for older adults with falling history. "Provide fall assessment tools and ensure frequent visits to patients at risk. Relative should also be involved in the care of these old patients, communication is also important." However, in most instance relatives are not involved in the care of older adults and there are no clear channels of communication between the nurses and families that live with fall patients. Some older adults live by themselves and even where they live with relatives, the relatives are not always present in the house to watch over the patient.

Rita shared nothing much since falls comes with old age. She felt that gathering information, finding the correct diagnosis, knowing the type of medicine patient is using and checking home environment for safety is vital if falls are to be prevented. She concluded by mentioning that if health facilities want more elderly people to be at home, they should give training so that they can be better.

Another point for detection and prevention of fall, which, according to Peter, can help prevent fall is creating a safe environment at home. "Adjust home environments, have supportive rails for example, in kitchen and bathroom in order to have a firm grip. Ensure that floor is not slippery. They can also have mats on bathroom and kitchen. The patients have enough fall prevention equipment at home." A similar point was shared by Ben. "Ensure proper footwear for easier movement and use of proper fall prevention equipment. Ben also added the need to have personnel managing older patients with fall trained and ensuring that they do follow ups. "Personnel to make often calls to ensure patients are well. Training of personnel to make them updated in order to detect early when the patient's ability to move is degraded."

Finally, a Stain mentioned, "Create awareness, organize seminars where we can talk about it. Trying to encourage other health workers to follow up after the fall assessment has been done. Assess every patient that comes in and follow up on guidelines according to the fall risk level which the patient is in."

These measures for fall detection and prevention correlate with how participants handle their patients and how the health facilities where they are attached to can help in improving their work environment. For some of the participants these measures are realistic and easily actionable. Another aspect is the inadequate number of staff to attend to patients. Most of the participants raised the concern and there is need to further look into staffing issue. Continuous update of staff on fall prevention procedure and equipment also plays a significant role in ensuring nurses and nurse assistants are effective in their job. The next section is going to discuss the findings in relation to research finding in other areas. The focus will be on relating the challenges faced by nurses will attending to fall patients and some of the recommendations to mitigate those challenges.

5. Discussion

This section provides insights into the research findings based on other research findings and the theoretical framework. I start by discussing actions contributing to fall among senior citizens in Norway. The discussion continues by expounding on challenges experienced by nurses and nurse assistants when identifying older adults at risk of falling. The third section covers aspects of problems experienced with fall prevention protocols. The fourth part provides some of the measures taken by nurses and nurse assistants to reduce fall incidences while the fifth section delves into challenges experienced by nurses in using fall prevention equipment. The last part addresses in details the interventions that are or should be put in place to prevent fall from nurses and nurse assistants' perspective.

5.1. Activities contributing to patient falls

Establishing good health and social support can create a beneficial experience for the older population. In 2002, the World Health Organization approved the idea of "Active Ageing" with the goal of extending people's healthy lives and improving their quality of life as they age. Older adults contribute considerably to this aspect by maintaining autonomy and independence, and safe housing can minimize falls as well as make their everyday lives more comfortable. According to a WHO 2002 report on fall prevention, the majority of falls among the elderly occur at home, making it crucial to prevent them. At home, the most common risk factors for falling as identified in our study included limited space, slippery floor, unstable shoes, and poor lighting. The findings

were similar to other studies that found uneven walkways, loose carpet in the living room, cables and other obstructions, improper doorsteps, dim lighting, and the lack of handrails and grab bars in the bathroom were the major risk factors for falls at home. Poor home surroundings, such as the presence of leaves, weeds, stones, or slick rain or moss-covered pathways, can also be hazardous. Elderly people's chairs and beds should be at a height that allows them to sit and stand comfortably. Environmental dangers are present in almost every home (Huang et al., 2005) and little effort has been made to eliminate them because most people are unaware of them (Aras R. et al., 2012). There is need for nurses and nurse assistants to share this professional knowledge.

In an Australian study by Carter S. et al.1997, 20% of houses were found to be free of any environmental danger of falling, whereas in our study, all the participants indicated that most of the household they have worked in none of the houses have environmental risk of falling. Other studies, comparable to ours, have shown environmental dangers in nearly all residences of elderly living in the community (Huang et al., 2005 &, Carter S. et al.1997). A review of the literature revealed that there is just a few Norwegian research on elderly home safety. The house set up was the most common type of fall risk seen by the nurses and nurse assistants especially the living rooms and bedrooms. In their study, Cornelissenet et al. (1995) discovered that with brighter lighting levels, elders were able to see more things in the living area, which may have benefits in preventing falls at home by avoiding tripping. Horgas et al. (1998) found that older persons spend an average of 12 to 16 hours each day in the house, hence lighting is a major issue that needs to be resolved in order to make houses suitable for elders in terms of ambulation. By improving lighting older adults can see obstacles in their path which are causes of fall. Hurdles in the walkway were found in 26% of the homes, which matched a study by Aras et al., (2012). In my findings, Nurses in my material indicate that falls frequently occur in bedrooms where older adults sleep. Similar findings were also indicated with different research as follows: About 37 % of homes had a light switch close their beds, contrast to 55.6 percent of homes in Karnataka (Aras et al., 2012) that had a light switch within accessible distance of their sleeping area. For elderly, having a light switch within reach is critical, particularly when they need to get out of bed late in the evening or early in the morning. Among our participants, the kitchen was deemed to be one of the environmental risk areas. The majority of the home safety checklist for fall prevention (Chacko et al., 2017) recommends that items in the kitchen be kept at an accessible height. Several participants in our

study mentioned improving the overall house environment including the kitchen to make them safe for older adults.

The participants also indicated that most falls occur when older adults go to the bathroom. A previous study found that 64% of individuals with a bathroom at home had a carpet outside their bathroom, which was greater than the 61 percent found in a study conducted in Karnataka (Aras et al., 2012). In a globe survey conducted by WHO, almost 44 percent of elders had to carry water from a source outside the house, which is considered a risk for falling. In our study this was not found, however, we discovered slippery floor as a risk factor (Kowal et al., 2013). This is almost similar to findings found in a different study that discovered algae development and an uneven bathroom floor, both of which could lead to a slip and fall. In their study Joshi et al. (2015) identified bathroom as one of the places with increased risk of falling. They recommended provision of support bar in the bathroom to reduce risk of falling. Only 70% of homes had an indoor toilet; the rest utilized public toilets or performed open air defecation. However, according to a study by (Saletti et al., 2005) in Bangalore, all of the residences had toilets, which was likely due to the fact that it was a city. A few toilets (1.8 percent) had grab bars placed, whereas in Aras R.'s study in Karnataka, grab bars were installed in every toilet. All participants in our study indicated that toilets were indoor. However, the study did not go into details of the interior design of the toilets for safety assessment. Other components that were not examined in the study but are important for assessing environmental risk factors was the outside older adults' homes. The findings from other studies shows the importance of assessing the external environmental risks as follows: Approximately 83 percent of households reported a fall risk at the front door and in the neighborhood. The presence of stones, leaves, and other obstructions on the pathway, which was seen in 44 percent of residences, was the most prevalent cause of a fall. According to Saletti et al., (2005) 94.5 percent of residences in the surrounding area had uneven surfaces, which is significantly higher than our findings. A study conducted in Karnataka (Aras et al., 2012) found only 28 percent with obstructions on the corridor and 36 percent covered in leaves. This could be due to the fact that these two potential fall risk factors were previously considered separately. Another research found houses with tilted entrances (15%), which were not identified as a concern in other studies, most likely because residences in other areas are not exposed to such a fall risk.

5.2. Challenges in identifying elderly at risk of falls

Human function deteriorates as people age, increasing the chance of falling. Falls not only cause moderate to severe accidents to the elderly, but they also put a mental and financial strain on the older people and their families (Faes et al., 2010). When confronted with this condition, it is critical to immediately and properly detect senior falls and provide emergency aid. In a nutshell, it is critical that persons who fall and are unable to cry for help are located and treated as soon as possible. The position nurse and nurse assistants occupy, having direct contact with older adults with fall experience, requires them to get involved in the patients' daily activities and ensuring they achieve the best outcomes. This responsibility should be accompanied with adequate staffing necessary in providing support for nurses and nurse assistants; however, some of the participants indicated that building trust and relationship with clients is a challenge. This occurred mostly when visiting a patient for the first time. Invasion of personal space and privacy also came up as most of the patients do not understand the need or the importance of questions used in assessing risks of falling.

5.3 Problems experienced with fall prevention protocols

In this study we were able to demonstrate the problems experienced by nurses while using fall prevention protocols. Most of the participants indicated that understaffing is an issue. Through our literature review, we were not able to find research that directly look at the experience of nurses and nurse assistants.

5.4 Measures by health care workers to reduce fall incidences

There are a variety of home assessments tools for risk of falling that can be utilized by the elderly themselves to make necessary changes (CDC, 2005). Standard checklists, such as Safer Home, WeHSA (Westmead Home Safety Assessment), Cougar (Fisher et al., 2006) and others, are verified instruments that trained professionals use to detect potential fall risks and make recommendations for modifications in the home environment. The majority of these assessments are more appropriate to western-style housing and assist evaluate the danger of falling in each room. Many developed countries have established a guideline to examine the quality of their houses in preventing falls as part of their fall prevention program, which may be used by either specialist who visit the elder's home or the elderly themselves to enable them to make necessary modifications in their homes.

Our findings were similar to other studies which mentioned walking aid as a measure for reducing fall among older adults. Falls can be avoided with the use of walking aids such as a cane or a wheeled walker. Offering your hand for assistance while walking is a simple test to see if your patient needs a gait aid (Gillespie et al.,2012). If this is beneficial, it is possible that a cane would be beneficial (Lam 2007). If they prefer to shop with two hands or a supermarket cart, it's possible that a wheeled walker may be a better option (Lam 2007). A basic size recommendation is to place the top of the walking stick or motorized walker's handle at the patient's wrist crease with arms at their sides, the user in perfect posture, and looking directly ahead (Lam 2007). If they usually fall backwards, one can lower the equipment height until they feel more comfortable. Walking aids help to enhance posture and alleviate musculoskeletal pain. One of the participants recorded, "give them walkers, good shoes, ensure good lighting in the house, talmodihet (patience), guide them on where they are going." A consultation with nurses and nurse assistant is advised to ensure that patients have the correct device. It is critical that patients are correctly fitted for these devices and that they receive training on how to use them securely. A fall can occur if the equipment is used incorrectly.

In the study we also found that comorbidity plays a critical role in fall among older adults and that drug interactions can also be a factor in fall. The participants recommended observing patients under medication and any changes in their general health- and ensuring proper lighting. The findings are similar to other studies that found that chronic conditions increase dosing frequency, which can lead to adverse drug events and drug interactions, which can raise the chance of falling. Additionally, changes in renal function, hepatic function, body mass, and adipose cause changes in pharmaceutical pharmacokinetic parameters, which impact the pharmacological activity of medications. Falls are more likely if you use four or more prescription drugs (Tinetti,2003). Based on the experience from nurses, closer attention should be given to patients with other underlying conditions that require them to take multiple drugs. While doing follow ups, nurses should check to ensure that patients are adhering to the prescribed dosage (Huang et al., 2012).

5.5 Challenges in using fall prevention equipment/tool

The participants noted the need for proper fall assessment tools. One of the participants suggested the use of technology and digital applications where we can detect falls or problems in different situations to help make life better. Participants also noted that sensors were not able to detect changes in fall and cameras were not able to differentiate between equipment and human. Limitations of fall prevention equipment have also been documented different research findings.

The limitations have been discussed in this section. Droghini et al., (2018) used sound waves broadcast on the surface to monitor falls. The research results are fairly accurate, although it used a dummy to simulate falls, which is still significantly different from an actual human fall. Furthermore, its detection mechanism is highly sensitive to external noise interference, and the surrounding environment is restricted. Shahzad et al., (2018) used smartphone sensors and reduced the algorithm's power consumption, however the phone can always create false positives and needs the user to wear the phone. Shiba et al., 2017 developed a microwave doppler sensor-based fall identification system that can accurately distinguish falls and fall-like movements while also not infringing on privacy. The detection range of this approach is too small, which is its only drawback. The threshold approach and machine learning are utilized by Quadros et al., (2018) to fuse various signals to recognize falls, which surely increases the identification results' reliability.

5.6 Interventions for detecting/ preventing falls

Falls are a serious public health issues with adverse health, social, and economic implications (Sotoudeh et al., 2018). Injuries such as hip or other fractures, head trauma, and subdural hematoma occur in one out of every ten older people who fall, resulting in mortality and morbidity (Jagnoor et al., 2014). Given the significant implications of falls, developing preventive treatments is critical (Noh et al., 2017). The majority of falls, according to studies, can be avoided (Kalula et al., 2016). Multi-factorial fall prevention programs, which comprise geriatric complete evaluation, fitness programs, medicine review, and fall prevention education, have been demonstrated to be beneficial in preventing falls. The identification of these risk factors, as well as the reduction of the number of risk factors, are critical stages in preventing future falls in our sample (Frith et al., 2019).

Some of the participants indicated the need for continuous updating of nurses and nurse assistants, “The staff also need continuous updates on elderly falls prevention strategies.” This was also reported in other studies: Home safety evaluations and adjustments, such as education and training, counseling, and follow-ups by nurses and nurse assistants to raise individual awareness, have been shown to be more effective in reducing falls in the homes of older persons. (Pi et al., 2015). Participants in our study also indicated that: Increasing awareness and holding seminars where nurses and nurse assistants can discuss is critical. Also, urging other health care providers to follow up after the fall evaluation and that every patient coming in is assessed, and recommendations are

followed based on the patient's fall risk level. Nurses and nurse assistants are key players in ensuring adherence to fall prevention procedures. They act as a continuum of care between assessment and treatment offered at the hospital and the long-term care provided at home. This was described by Gürler et al., 2021 who indicated that nurse-led fall prevention program was very effective in reducing the number of risk factors for falls, as well as the frequency of urine incontinence, constipation, and the use of pharmaceuticals/herbal remedies without visiting a physician.

6. Conclusion

Since the older population is quickly growing, immediate action is required to adopt professional knowledge generated by nurses based on their experience working with older adults. This will allow elderly to live in a safer environment and reduce the risk of injury and death from falls. With the rise in physical, emotional, and financial costs associated with the aging population, nurses and nurse assistants must be aware of and assess the risks of falls. Nurses and nursing assistants are well-positioned to care for seniors who have had previous falls. Fall prevention and detection knowledge has the ability to improve patients' quality of life and may also be a source of improved professional satisfaction.

This study aimed to unpack the perspectives of front-line workers in Norway concerning their direct interactions and work with older adults with history of falling. It also aimed to explore their personal experiences, and their thoughts about their work with older adults living at home. From the gathered information, it was possible to identify certain aspects that contribute to prevention and detection of fall among older adults. These factors included predisposing condition such as dementia, poor visibility, slippery floor and obstacles in the pathways. The first was the need for identification of activities contributing to patient fall. A deeper study of this problem could help policymakers come up with better proposals and more suitable approaches to fall prevention and detection. A second issue that the participants discussed was challenges in identifying older adults at risk of falling. With regard to this, the participants pointed out patient factors that contribute to the challenges of managing fall patients, and other misconception about privacy and autonomy of the patient.

A third aspect was problems with fall prevention protocol. The different problems with prevention protocol as experienced by nurses and nurse assistants was shared. This spoke to the importance of having health care workers updated on prevention protocols. All the participants also expressed the challenge of inadequate staffing that hinder them from following certain fall prevention procedures. The fourth perspective looked at measures nurses and nurse assistants take to prevent fall among their patients. Both the nurse and nurse assistants shared the importance of creating a safe environment for older adults by removing obstacles from their pathways. Further, the fifth component talked about the challenges of using fall prevention equipment. Some of the common fall prevention equipment used by the participants included; canes, walkers, wheel walkers, and

elevated walkers. The last point involves interventions for detecting/ preventing falls. The participants described strategies used in preventing fall among older adults.

Despite these setbacks, these front-line employees expressed their commitment to assist patients who have a history of falling. Their goals remained the same: to reach out to a larger number of individuals and to reduce the frequency of falls among elderly persons getting home care. They strive to improve the lives of older people who have had falls in the past, as well as their families. Whereas these conclusions cannot be applied universally, they do offer insights on the perspectives of these front-line personnel and their experiences taking care of patients who have had previous falls. It is essential to recognize and make functional adjustments to improve the working conditions of more health care workers by having access to this data.

References

Abbate, S. (2010). Monitoring of Human Movements for Fall Detection and Activities Recognition in Elderly Care Using Wireless Sensor Network: a Survey. In: IntechOpen.

Arbesman, M., Campbell, R. M., & Rhynders, P. A. (2001). תפקיד המרפאה בעסוק במניעת חבלות/The Role of Occupational Therapy in Injury Prevention. *כתב עת ישראלי לריפוי בעיסוק*, E97-E108.

Aras, R. Y., Narayan, V., D D'souza, N., & Veigas, I. (2012). Assessment of accident risk among elderly in domestic environment: A cross-sectional study in rural south Karnataka, India. Annals of Tropical Medicine and Public Health, 5(6), 565.

Berland, A., Gundersen, D., & Bentsen, S. B. (2012). Patient safety and falls: A qualitative study of home care nurses in Norway. *Nursing & health sciences, 14*(4), 452-457.

Bernard, H. R. (2017). *Research methods in anthropology: Qualitative and quantitative approaches*. Rowman & Littlefield.

Bishop, C. A., & Boyle, A. T. (2016). The Role of Safety Culture in Influencing Provider Perceptions of Patient Safety. *Journal of Patient Safety, 12*(4), 204-209. doi:10.1097/PTS.0000000000000092

Bjørnholt, M., Stefansen, K., Wężyk, A., & Merecz, D. (2017). The Role of Family Policy Regimes in Work-Family Adaptations: Polish Parents in Norway and Poland. *Centraland Eastern European Migration Review, 6,* 31–50. doi:10.17467/ceemr.2017.12

Boffin, N., Moreels, S., Vanthomme, K., & Van Casteren, V. (2014). Falls among older general practice patients: a 2-year nationwide surveillance study. *Family practice*, *31*(3), 281-289.

Bryman, A. (2016). *Social research methods*. Oxford university press.

Campbell, A. J., Robertson, M. C., La Grow, S. J., Kerse, N. M., Sanderson, G. F., Jacobs, R. J., ... &

Hale, L. A. (2005). Randomised controlled trial of prevention of falls in people aged≥ 75 with severe visual impairment: the VIP trial. *BMJ*, *331*(7520), 817.

Campbell, A., BORRIE, M. J., SPEARS, G. F., JACKSON, S. L., BROWN, J. S., & FITZGERALD, J. L. (1990). Circumstances and consequences of falls experienced by a community population 70 years and over during a prospective study. *Age and aging*, *19*(2), 136-141.

Carter, S. E., Campbell, E. M., Sanson-Fisher, R. W., Redman, S., & Gillespie, W. J. (1997). Environmental hazards in the homes of older people. Age and ageing, 26(3), 195-202.

Centers for Disease Control and Prevention. (2005). Check for safety: a home fall prevention checklist for older adults. *Atlanta, GA: CDC*.

Chase, C. A., Mann, K., Wasek, S., & Arbesman, M. (2012). A systematic review of the effect of home modification and fall prevention programs on falls and the performance of community-dwelling older adults. *American Journal of Occupational Therapy*, *66*(3), 284-291.

Chacko, T. V., Thangaraj, P., & Muhammad, G. M. (2017). How Fall-Safe is the Housing for the Elderly in Rural Areas?: A Cross Sectional Study using Fall Prevention Screening Checklist. Journal of the Indian Academy of Geriatrics, 13(3).

Chou, W. C., Tinetti, M. E., King, M. B., Irwin, K., & Fortinsky, R. H. (2006). Perceptions of physicians on the barriers and facilitators to integrating fall risk evaluation and management into practice. *Journal of general internal medicine*, *21*(2), 117-122.

Cresswell, J. W., & Plano Clark, V. L. (2011). Designing and conducting mixed-method research. 2nd Sage. *Thousand Oaks, CA, 201*.

Cornelissen, F. W., Bootsma, A., & Kooijman, A. C. (1995). Object perception by visually impaired people at different light levels. *Vision research*, *35*(1), 161-168.

Danielsen, A., Olofsen, H., & Bremdal, B. A. (2016). Increasing fall risk awareness using wearables: a fall risk awareness protocol. *Journal of biomedical informatics*, *63*, 184-194.

Droghini, D., Principi, E., Squartini, S., Olivetti, P., & Piazza, F. (2018). Human fall detection by using

an innovative floor acoustic sensor. In *Multidisciplinary Approaches to Neural Computing* (pp. 97-107). Springer, Cham.

Eriksson K. 2006. Theory of caritative caring. In: Marriner Tomey A, Alligood MR, eds. Nursing theorists and their work. 6th edition. St. Louis: Mosby, 191_223.

Faes, M. C., Reelick, M. F., Joosten-Weyn Banningh, L. W., Gier, M. D., Esselink, R. A., & Olde Rikkert, M. G. (2010). Qualitative study on the impact of falling in frail older persons and family caregivers: foundations for an intervention to prevent falls. *Aging & mental health*, *14*(7), 834-842.

Fisher, G. S., Coolbaugh, K., & Rhodes, C. (2006). Field Test of the Cougar Home Safety Assessment for Older Persons Version 1.0. *Californian journal of health promotion*, *4*(2), 181-196.

Frith, K. H., Hunter, A. N., Coffey, S. S., & Khan, Z. (2019). A longitudinal fall prevention study for older adults. *The journal for nurse practitioners*, *15*(4), 295-300.

Fuller, G. F. (2000). Falls in the elderly. *American family physician*, *61*(7), 2159.

Gillespie, L. D., Robertson, M. C., Gillespie, W. J., Sherrington, C., Gates, S., Clemson, L., & Lamb, S. E. (2012). Interventions for preventing falls in older people living in the community. *Cochrane database of systematic reviews*, (9).

Haagsma, J. A., Olij, B. F., Majdan, M., Van Beeck, E. F., Vos, T., Castle, C. D., ... & Polinder, S. (2020). Falls in older-aged adults in 22 European countries: incidence, mortality, and disease burden from 1990 to 2017. *Injury prevention*, *26*(Supp 1), i67-i74.

Howcroft, J., Kofman, J., & Lemaire, E. D. (2013). Review of fall risk assessment in geriatric populations using inertial sensors. *Journal of neuroengineering and rehabilitation*, *10*(1), 1-12.

Horgas, A. L., Wilms, H. U., & Baltes, M. M. (1998). Daily life in very old age: Everyday activities as expression of successful living. The Gerontologist, 38(5), 556-568.

Huang, A. R., Mallet, L., Rochefort, C. M., Eguale, T., Buckeridge, D. L., & Tamblyn, R. (2012). Medication-related falls in the elderly. *Drugs & aging*, *29*(5), 359-376.

Huang, T. T. (2005). Home environmental hazards among community-dwelling elderly persons in Taiwan. The journal of nursing research: JNR, 13(1), 49-57.

Hughes, K., van Beurden, E., Eakin, E. G., Barnett, L. M., Patterson, E., Backhouse, J., . . . Newman, B. (2008). Older persons' perception of risk of falling: implications for fall-prevention campaigns. *American journal of public health*, *98*(2), 351-357.

Gürler, H., & Bayraktar, N. (2021). The effectiveness of a recurrent fall prevention program applied to elderly people undergoing fracture treatment. *International journal of orthopaedic and trauma nursing*, *40*, 100820.

Jagnoor, J., Keay, L., Jaswal, N., Kaur, M., & Ivers, R. (2014). A qualitative study on the perceptions of preventing falls as a health priority among older people in Northern India. *Injury Prevention*, *20*(1), 29-34.

Jesse DE, Alligod MR. 2014. Watson's philosophy and theory of transpersonal caring. In: Alligood MR, ed. Nursing theorists and their work. 8th edition. Maryland Heights: Mosby Elsevier, 79_97.

Joshi, R., & Dsouza, S. (2015). Bathroom hazards among older adults in western India: a cross-sectional study. *Asian Journal Gerontology Geriatric*, *10*(2), 83-91.

Kaur D, Sambasivan M, Kumar N. (2013). Effect of spiritual intelligence, emotional intelligence, psychological ownership and burnout on caring behavior of nurses: a cross-sectional study. Journal of Clinical Nursing 22(2122):31923202 DOI 10.1111/jocn.12386.

Kowal, K. P., & Chatterji, S. (2013). Measuring prevalence and risk factors for fall-related injury in older adults in low-and middle-income countries: results from the WHO Study on Global AGEing and Adult Health (SAGE). WHO Working Paper.

Kalula, S. Z., Ferreira, M., Swingler, G. H., & Badri, M. (2016). Risk factors for falls in older adults in a South African Urban Community. *BMC geriatrics*, *16*(1), 1-11.

Labrague LJ, McEnroe-Petitte DM, Papathanasiou IV, Edet OB, Arulappan J. (2015). Impact of instructors' caring on students' perceptions of their caring behaviors. Journal of Nursing Scholarship 47(4):338346 DOI 10.1111/jnu.12139.

Laing, S. S., Silver, I. F., York, S., & Phelan, E. A. (2011). Fall prevention knowledge, attitude, and practices of community stakeholders and older adults. *Journal of aging research*, *2011*.

Lam, R. (2007). Choosing the correct walking aid for patients. *Canadian Family Physician*, *53*(12), 2115-2116.

Lee, J., Geller, A. I., & Strasser, D. C. (2013). Analytical review: focus on fall screening assessments. *PM&R*, *5*(7), 609-621.

Li, F., Eckstrom, E., Harmer, P., Fitzgerald, K., Voit, J., & Cameron, K. A. (2016). Exercise and fall prevention: narrowing the research-to-practice gap and enhancing integration of clinical and community practice. *Journal of the American Geriatrics Society*, *64*(2), 425-431.

Lord, S. R., Ward, J. A., Williams, P., & Anstey, K. J. (1993). An epidemiological study of falls in older community-dwelling women: the Randwick falls and fractures study. *Australian journal of public health*, *17*(3), 240-245.

Majdan, M., & Mauritz, W. (2015). Unintentional fall-related mortality in the elderly: comparing patterns in two countries with different demographic structure. *BMJ Open*, *5*(8), e008672.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. Sage.

Nelson J, Watson J. 2012. Measuring caring: international research on Caritas as healing. New York: Springer Publishing Company.

Nikolaus, T., & Bach, M. (2003). Preventing falls in community-dwelling frail older people using a home intervention team (HIT): results from the randomized Falls-HIT trial. *Journal of the American Geriatrics Society*, *51*(3), 300-305.

Noh, J. W., Kim, K. B., Lee, J. H., Lee, B. H., Kwon, Y. D., & Lee, S. H. (2017). The elderly and falls: Factors associated with quality of life A cross-sectional study using large-scale national data in Korea. *Archives of gerontology and geriatrics*, *73*, 279-283.

Oliver, D., & Healy, F. (2009). Falls risk prediction tools for hospital inpatients: do they work. *Nurs Times*, *105*(7), 18-21.

Quadros, T., Lazzaretti, A. E., & Schneider, F. K. (2018). A movement decomposition and machine learning-based fall detection system using wrist wearable device. *IEEE Sensors Journal*, *18*(12), 5082-5089.

Pajnkihar M. (2003). Theory development for nursing in Slovenia. Ph.D. thesis, University of Manchester, Faculty of Medicine, Dentistry, Nursing, and Pharmacy.
Pajnkihar M. (2008). Is caring a lost art in nursing? International Journal of Nursing Studies 45(5):807808 DOI 10.1016/j.ijnurstu.2007.09.013.

Palese A, Tomietto M, Suhonen R, Efstathiou G, Tsangari H, Merkouris A, Jarosova D, Leino-Kilpi H, Patiraki E, Karlou C, Balogh Z, Papastavrou E. (2011). Surgical patient satisfaction as an outcome of nurses' caring behaviors: a descriptive and correlational study in six European countries. Journal of Nursing Scholarship 43(4):341350 DOI 10.1111/j.1547-5069.2011.01413.x.

Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and policy in mental health and mental health services research*, *42*(5), 533-544.

Pi, H. Y., Hu, M. M., Zhang, J., Peng, P. P., & Nie, D. (2015). Circumstances of falls and fall-related

injuries among frail elderly under home care in China. *International journal of nursing sciences*, *2*(3), 237-242.
Pighills, A. C., Torgerson, D. J., Sheldon, T. A., Drummond, A. E., & Bland, J. M. (2011). Environmental assessment and modification to prevent falls in older people. Journal of the American Geriatrics Society, 59, 26–33. http://dx.doi. org/10.1111/j.1532-5415.2010.03221.x
Pin, S., & Spini, D. (2016). Impact of falling on social participation and social support trajectories in a middle-aged and elderly European sample. *SSM-population health*, *2*, 382-389.
Rubenstein, L. Z. (2006). Falls in older people: epidemiology, risk factors and strategies for prevention. *Age and aging*, *35*(suppl_2), ii37-ii41.
Saletti, A., Johansson, L., Yifter-Lindgren, E., Wissing, U., Österberg, K., & Cederholm, T. (2005). Nutritional status and a 3-year follow-up in elderly receiving support at home. Gerontology, 51(3), 192-198.
Shahzad, A., & Kim, K. (2018). FallDroid: An automated smart-phone-based fall detection system using multiple kernel learning. *IEEE Transactions on Industrial Informatics*, *15*(1), 35-44.
Shiba, K., Kaburagi, T., & Kurihara, Y. (2017). Fall detection utilizing frequency distribution trajectory by microwave Doppler sensor. *IEEE Sensors Journal*, *17*(22), 7561-7568.
Snowden A, Stenhouse R, Young J, Carver H, Carver F, Brown N. (2015). The relationship between emotional intelligence, previous caring experience, and mindfulness in student nurses and midwives is a cross-sectional analysis. Nurse Education Today 35(1):152_158 DOI 10.1016/j.nedt.2014.09.004.
Sotoudeh, G. R., Mohammadi, R., Mosallanezhad, Z., Viitasara, E., & Soares, J. J. (2018). The prevalence, circumstances and consequences of unintentional falls among elderly Iranians: A population study. *Archives of gerontology and geriatrics*, *79*, 123-130.
Steultjens, E. M., Dekker, J., Bouter, L. M., Jellema, S., Bakker, E. B., & Van Den Ende, C. H. (2004). Occupational therapy for community-dwelling elderly people: a systematic review. *Age and aging*, *33*(5), 453-460.
Tinetti, M. E. (2003). Preventing falls in elderly persons. *New England journal of medicine*, *348*(1), 42-49.
Verghese, J., Holtzer, R., Lipton, R. B., & Wang, C. (2009). Quantitative gait markers and incident fall risk in older adults. *The Journals of Gerontology: Series A*, *64*(8), 896-901.
Watson J. (1999). Nursing: human science and human care: a theory of nursing. Boston: Jones & Bartlett Learning.
Watson J. (2008). Nursing: the philosophy and science of caring (revised edition). Boulder: University Press of Colorado.
Watson J. (2009). Caring science and human caring theory: transforming personal and professional practices of nursing and health care. Journal of Health and Human Services Administration 31:466_482.
Watson, J., & Woodward, T. (2010). Jean Watson's theory of human caring. *Nursing theories and nursing practice*, *3*, 351-369.
Watson J. 2012. Human caring science a theory of nursing. 2nd edition. Sudbury: Jones & Bartlett Learning.
Wenger, N. S., Solomon, D. H., Roth, C. P., MacLean, C. H., Saliba, D., Kamberg, C. J., ... & Shekelle, P. G. (2003). The quality of medical care provided to vulnerable community-dwelling older patients. *Annals of internal medicine*, *139*(9), 740-747.
World Health Organization. (2002). *Active ageing: A policy framework* (No. WHO/NMH/NPH/02.8). World Health Organization.

WHO. (2008). *WHO global report on falls prevention in older age*: World Health Organization.
WHO. (2018). Falls: fact sheet, 2018. *Accessed June 25*.
Wilson, D. S., Montie, M., Conlon, P., Reynolds, M., Ripley, R., & Titler, M. G. (2016). Nurses' Perceptions of Implementing Fall Prevention Interventions to Mitigate Patient-Specific Fall Risk Factors.*Western Journal of Nursing Research, 38*(8), 1012-1034. doi:10.1177/0193945916644995

Appendix 1: NSD Assessment

NSD's assessment

Project title

Investigating barriers in facilitation of effective fall detection and prevention among the elderly living at home: Home based care givers' perspective.

Reference number

292283

Registered

13.02.2021 av Josphine Wanjira Njeru - s320849@oslomet.no

Data controller (institution responsible for the project)

OsloMet – storbyuniversitetet / Fakultet for samfunnsvitenskap / Institutt for sosialfag

Project leader (academic employee/supervisor or PhD candidate)

Kjetil Wathne, kjetwa@oslomet.no, tlf: +4767238124

Type of project

Student project, Master's thesis

Contact information, student

Josphine Njeru, jossienjeru@yahoo.com, tlf: 45549136

Project period

22.02.2021 - 14.08.2021

Status

14.08.2021 - Closed

Assessment (2)

08.06.2021 - Assessed

NSD has assessed the change registered on 16.05.2021.

The research period has been extended until 14.08.2021.

Please note that in case of further extensions, it may be necessary to inform the sample.

NSD will follow up the progress of the project at the new planned end date in order to determine whether the processing of personal data has been concluded/

Contact person at NSD: Henriette N. Munthe-Kaas

Good luck with the rest of the project!

19.02.2021 - Assessed

Our assessment is that the processing of personal data in this project will comply with data protection legislation, so long as it is carried out in accordance with what is documented in the Notification Form and attachments, dated 13.02.2021, as well as in correspondence with NSD. Everything is in place for the processing to begin.

NOTIFY CHANGES If you intend to make changes to the processing of personal data in this project it may be necessary to notify NSD. This is done by updating the information registered in the Notification Form. On our website we explain which changes must be notified. Wait until you receive an answer from us before you carry out the changes.

TYPE OF DATA AND DURATION The project will be processing general categories of personal data until 15.05.2021

LEGAL BASIS The project will gain consent from data subjects to process their personal data. We find that consent will meet the necessary requirements under art. 4 (11) and 7, in that it will be a freely given, specific, informed and unambiguous statement or action, which will be documented and can be withdrawn. The legal basis for processing personal data is therefore consent given by the data subject, cf. the General Data Protection Regulation art. 6.1 a).

PRINCIPLES RELATING TO PROCESSING PERSONAL DATA NSD finds that the planned processing of personal data will be in accordance with the principles under the General Data Protection Regulation regarding:

- lawfulness, fairness and transparency (art. 5.1 a), in that data subjects will receive sufficient information about the processing and will give their consent

- purpose limitation (art. 5.1 b), in that personal data will be collected for specified, explicit and legitimate purposes, and will not be processed for new, incompatible purposes

- data minimisation (art. 5.1 c), in that only personal data which are adequate, relevant and necessary for the purpose of the project will be processed

- storage limitation (art. 5.1 e), in that personal data will not be stored for longer than is necessary to fulfil the project's purpose

THE RIGHTS OF DATA SUBJECTS Data subjects will have the following rights in this project: transparency (art. 12), information (art. 13), access (art. 15), rectification (art. 16), erasure (art. 17), restriction of processing (art. 18), notification (art. 19), data portability (art. 20). NB! Any exceptions must be justified and have a legal basis. These rights apply so long as the data subject can be identified in the collected data. (Refer to arts. 21-22 if applicable).

NSD finds that the information that will be given to data subjects about the processing of their personal data will meet the legal requirements for form and content, cf. art. 12.1 and art. 13.

We remind you that if a data subject contacts you about their rights, the data controller has a duty to reply within a month.

FOLLOW YOUR INSTITUTION'S GUIDELINES

NSD presupposes that the project will meet the requirements of accuracy (art. 5.1 d), integrity and confidentiality (art. 5.1 f) and security (art. 32) when processing personal data. To ensure that these requirements are met you must follow your institution's internal guidelines and/or consult with your institution (i.e., the institution responsible for the project).

FOLLOW-UP OF THE PROJECT

NSD will follow up the progress of the project underway (every other year) and at the planned end date in order to determine whether the processing of personal data has been concluded/is being carried out in accordance with what is documented.

Good luck with the project!

Contact person at NSD:

Data Protection Services for Research: +47 55 58 21 17 (press 1)

Appendix 2: Informed consent

Are you interested in taking part in the research project?

"Investigating barriers in facilitation of effective fall detection and prevention among the elderly living at home: Home based care givers' perspective".

This is an inquiry about participation in a research project where the main purpose is to investigate barriers in facilitation of effective fall detection and prevention among the elderly living at home. In this letter we will give you information about the purpose of the project and what your participation will involve.

Purpose of the project

This is a master thesis aimed at finding out why elderly falls with bad outcomes are still recorded despite the known causative factors and preventive measures.

The research question will be; What are barriers to effective fall detection and prevention among the elderly living at home?

Who is responsible for the research project?

Oslo metropolitan university is the institution responsible for the project.

Why are you being asked to participate?

Study population will consist of health caregivers from one municipality in Oslo providing direct care to elderly living at home. Selection of the participants will be done by nonprobability sample of convenience type. Inclusion criteria will be nurses and nurse assistants with an experience of more than two years in homebased care.

What does participation involve for you?

Interview guide alongside a review of the literature in the field will be utilized. Information about hindrances to effective fall detection and prevention will be collected, the information will be collected using sound recordings.

The survey includes questions about barriers to fall detection and fall prevention among the elderly living at home.

Participation is voluntary

Participation in the project is voluntary. If you chose to participate, you can withdraw your consent at any time without giving a reason. All information about you will then be made

anonymous. There will be no negative consequences for you if you chose not to participate or later decide to withdraw. It will not affect relationship with the researcher.

Your personal privacy – how we will store and use your personal data.

We will only use your personal data for the purpose(s) specified in this information letter. We will process your personal data confidentially and in accordance with data protection legislation (the General Data Protection Regulation and Personal Data Act).

- Only the student and the supervisor will have access to the personal data.
- I will replace your name with a code and the respective codes will be stored separately from the rest of collected data.

What will happen to your personal data at the end of the research project?

The project is scheduled to end on 14.08.2021. All personal data will be destroyed at the end of the project.

Your rights

So long as you can be identified in the collected data, you have the right to:

- access the personal data that is being processed about you.
- request that your personal data is deleted.
- request that incorrect personal data about you is corrected/rectified.
- receive a copy of your personal data (data portability), and
- send a complaint to the Data Protection Officer or The Norwegian Data Protection Authority regarding the processing of your personal data.

What gives us the right to process your personal data?

We will process your personal data based on your consent.

Based on an agreement with Oslo metropolitan university NSD – The Norwegian Centre for Research Data AS has assessed that the processing of personal data in this project is in accordance with data protection legislation.

Where can I find out more?

If you have questions about the project, or want to exercise your rights, contact:

- Oslo metropolitan university via Josphine Wanjira Njeru (student) and Kjetil Watne (supervisor) telephone +4767238124
- Our Data Protection Officer: Ingrid Jacobsen, Phone: +47 63 23 55 34 Email: personvernombud@oslomet.no

- NSD – The Norwegian Centre for Research Data AS, by email: () or by telephone: +47 55 58 21 17.

Yours sincerely,

Project Leader: Kjetil Watne Student: Josphine Wanjira Njeru

(Researcher/supervisor)

Consent form

I have received and understood information about the project barriers to effective fall detection and prevention among the elderly living at home and have been given the opportunity to ask questions. I give consent:

To participate in an interview.

I give consent for my personal data to be processed until the end date of the project, which will be on 14.08.2021

(Signed by participant, date)

Appendix 3: Interview Guide

1. What is your age?
2. What is your designation?
3. Have ever witnessed a patient fall?
4. During what activity do patients fall most?
5. What do you think is the most common reason for elderly patient falling?
6. What protocols are put in place by your facility to reduce patient falls?
7. Do you experience any problems with your facility's' fall prevention procedures?
8. Does your facility have tools to assess patients fall risk? If yes, mention a few.
9. Do you experience any problem with your facility's fall assessment tools?
10. Does your facility provide any specialized equipment to prevent elderly falls? If yes give examples.
11. What challenges do you experience with your facility's fall prevention equipment mentioned above?
12. what intervention do you think your facility could make to prevent elderly patient falls?