Assessment and Prevention Of Falls In Elderly: Nurses' Role.

Abstract

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Title of publication
Assessment and prevention of falls in elderly: Nurses' role

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Falls in elderlies has been a major concern in geriatric care. One out of three elderlies have been falling every year and the many more elderlies are constantly at risk of falls. These falls lead to serious injuries like hip fractures and build sense of fear in elderlies, which limit their activities and degrade their quality of life.

There has been seen a huge need to enhance the skill and knowledge of the present and future nurses to ensure that they are professionally and personally capable to identify the risk factors and plan prevention strategies accordingly.

Literature review has been used in this thesis to find out the possible assessment methods to assess the risk factors of falls in elderly, the vulnerable groups of elderlies who have higher chances of falling. In addition, the possible falls prevention strategies have been studied and laid out in this thesis.

A total of 11 relevant articles were obtained from a reliable database search.

The contents of the thesis have been categorized into distinct assessment and prevention headings for ease of reading and finding required information. In the conclusion end, the author has presented his own ideas and discussed the additional need for safety of elderlies.

Keywords**:** Falls in elderly, Accidental falls, Accidental Falls-Risk factors, Risk assessment, Falls Prevention.

Tiivistelmä

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Vanhusten kaatumiset ovat olleet suuri huolenaihe geriatrisessa hoidossa. Yksi kolmesta vanhuksesta on kaatunut vuosittain ja monilla vanhuksella on jatkuvasti kaatumisriski. Nämä kaatumiset johtavat vakaviin vammoihin, kuten lonkkamurtumiin ja lisäävät pelkoa ikääntyneissä, mikä rajoittaa heidän toimintaansa ja heikentää heidän elämänlaatuaan.

Nykyisten ja tulevien sairaanhoitajien taitojen ja tietämyksen parantamiseksi on nähty valtava tarve varmistaa, että he kykenevät ammatillisesti ja henkilökohtaisesti tunnistamaan riskitekijät ja suunnittelemaan ehkäisystrategioita vastaavasti.

Tässä opinnäytetyössä on käytetty kirjallisuuskatsausta selvittämään mahdolliset arviointimenetelmät kaatumisten riskitekijöiden arvioimiseksi vanhuksilla, heikossa asemassa olevilla ikäluokkien ryhmillä, joilla on korkeammat mahdollisuudet kaatua. Lisäksi tutkielmassa on tutkittu ja esitetty mahdollisia kaatumisstrategioita.

Luotettavasta tietokantahausta saatiin yhteensä 11 asiaankuuluvaa artikkelia.

Opinnäytetyön sisältö on luokiteltu erillisiin arviointi- ja ehkäisyotsikoihin lukemisen ja vaaditun tiedon löytämisen helpottamiseksi. Lopuksi kirjoittaja on esittänyt omat ajatuksensa ja keskustellut vanhusten turvallisuuden lisätarpeista.

Avainsanat**:** Falls in elderly, Accidental falls, Accidental Falls-Risk factors, Risk assessment, Falls Prevention.

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1   INTRODUCTION

In the present world with the advancement of science and medicine, life expectancy has been increasing remarkably. According to the statistics provided by WHO, 2018, the population of elderlies over the age of 60 years is forecasted to reach 2 billion from a population of 900 million recorded in 2015. By 2018 the population of elderlies over the age of 80 years was 125 million. Moreover, the majority of the elderlies (80%) are expected to be living in middle and low income countries by 2050. This has and will result in more and more elderly people and need for professionals and family members to care for them. The increasing number of elderly homes and nursing homes' demands for a better educated and well-trained workforce to support the elderly people. This trend has been expected rise furthermore in the future. With the need in a greater number of health professionals globally, the demand of nurses has been greater as the nurses are the ones who take care of the elderlies 24/7. Hence, it is very important for the nurses to be well trained and realize the common problems and threats the elderlies face to provide them a quality and safe care (Blake, 2013.)

Among the many problems the elderlies face, falls is the major one and this thesis is focused at studying the whole process of fall with its aspects: causes, risk factors and possible preventive measures, which can be applied by the nurses within their capacity.

Falls have been a major issue in caring for the elderly as it can suddenly degrade the quality of life and state of general wellbeing in elderlies, along with depression, feeling of helplessness and social isolation. Falls can result in a sense of embarrassment and have a physical and psychological effect in the elderly. It can also result to long term care or death in them as their body has low recovering capacity. Falls can also lower the confidence of the elderly and make them more unwilling to move, which makes their muscles

and bones weaker and increase the chances of another fall (Oxtoby, 2017; Blake, 2013.)

Falls have been often considered as an inevitable hazard in elderly because it is a consequence of the normal weakness developed because of ageing. However, the contributing factors to the falls can be altered, modified and the underlying risk factors can be analyzed, and a safer environment can be constructed. This thesis focuses in based on this concept and the role of a nurse in this process has been studied. Falls also have major effects on the society as the total cost of conditions resulted due to falls has amounted to more than 2 billion pounds per year, which is the costliest medical condition and expense (Oxtoby, 2017.)

More than 10% of the falls in elderlies lead to serious injuries and requires hospital admission. Cuts, wounds and factures are very common problems caused by falls. Apart from these physical harms it also creates to mental and psychological problems in the elderlies, which might lead to other severe problems like depression or anxiety. The most common fall related hospitalization in the elderlies are due to hip fractures (50%), arm fractures (13%), and head injuries (10%). Meanwhile over 90% of the hip fractures in elderlies are caused by falls. Hip fracture is often the most serious injuries among falls related injuries as it results in prolonged hospitalization and limits the physical movements and exercise in the elderlies for a longer period. It also needs a longer rehabilitation process and demands a costly and multi-professional care (Oh, Park, Lee, Oh, Cho, Jang & Baik, 2012.) Furthermore, Oxtoby, 2017 highlights that the NHS England, which is a public healthcare body, spends more than 2 billion pounds every year making it one of the most expensive problems.

2   DEFINATIONS & BACKGROUND

2.1   Definition of Elderly people & falls

The term elderly refers to the population above the age of 65 years in most developed countries. Neither WHO nor UN has adapted any exact age limit or criteria to define elderly, however they have agreed that the cutoff as 60+ to refer to any population as elderly or old. But it differs in terms of African countries and some Asian countries as well where the heath care and other lifestyle is different which makes people feel old earlier. Most of the developing countries regard as the population old or elderly when they can no longer actively contribute to work. Hence it is difficult to categorize elderly people numerically based on their age as it is also an individual feeling. Most of the countries and organizations regard the age where the people start to retire and receive pensions from work as the cutoff for elderly. (WHO, 2016.) People over the age of 75 will be referred to, whenever the term elderly is mentioned in the thesis.

According to WHO (2016), a fall is defined as an event where a person suddenly comes to rest on the ground or any other lower level. Falls is considered to happen when a person's normal state or desired state or position is disturbed, and the person lands up in and undesired position on the floor or any lower level, which is awkward and painful at times. Falls can be fatal as well as non-fatal. These falls can be life threatening in elderly people. It is the second most common cause of intentional or accidental cause of death globally.

There is no much varieties of definition of falls and most of the research, healthcare and other related parties have been following the World Health Organization's definition of falls. In contrast, definition and perception of elderly has been very different depending on culture, sex, environment and other factors.

2.2   Causes of falls in elderly people

Falls in elderly people can be caused by various reasons. The body has weak muscles, bones and the balance are disturbed which as well makes the elderlies vulnerable to any causes. the most common causes of falls in older people can be dizziness caused by different medications, medical conditions like Parkinson's, physical conditions like uneven floor, slippery or snowy roads, slippery footwears, poor eyesight, poor lightning, improper placement of the furniture etc. (Oxtoby,2017.)

Nutrition is another important factor as elderlies have a great chance of being undernourished because of lack of appetite, digestion, side effects of medicines etc. Unnecessary physical objects like furniture or mats can cause falls. The use of bed rails has also been much debated. Some badly designed and old bed rails have been found to cause injuries, which could be deadly, and excessive use of them is also regarded unethical. (Oxtoby, 2017.)

The possible risk factors of falls in elderly are categorized in to classes namely:

Intrinsic factors: These are the factors which are individual strength and   performance levels like age, muscle strength, heart conditions etc. the most common causes in this class are certain medical conditions like Parkinson's, Alzheimer's, sudden blood pressure drops, glucose levels drop, orthopedic problems like arthritis, stiffness of joints, poor vision, confusion etc. (Poutney, 2009; Rubenstein, 2016.)

Extrinsic factors: These are the external environmental factor which can be altered and controlled to certain extent. The factors like poor lightening, uneven or slippery surfaces or floors, steep stairs or floors, improper footwears, loose clothing which can get stuck to any surfaces, unsafe assistive devices etc. (Poutney, 2009; Rubenstein, 2016.)

Situational factors: these factors refer to those activities and situations where the chances of falls my increase. For example, while rushing to answer the phone, getting distracted due to some sight or noise, rushing to washroom during night or not dully awake etc. the elderlies have more chances of falling when they are multi-tasking as well. (Rubenstein, 2016.)

2.3   Nurses`general roles & responsibilities

A nurse's role is to assess the risk of falls in an elderly and prevent it. A nurse should be capable to assess the needs of the elderly to avoid falls. The elderlies should be supported enough to live their life without the fear of falls in a physically and mentally sound environment. However, the individuality and self-dependency of the elderlies have to be considered at all times. A nurse should identify the risk of falls and make proper care plan or reference to a physician or required parties. A nurse's role starts form the early prevention to the rehabilitation of falls and further follow up and evaluation. (RNAO, 2017.)

A nursing process includes of well-defined and designed steps and stages namely: Assessment, Diagnosis, Planning, Implementation and Evaluation. Hence, these all steps are the basic responsibilities and duties of a nurse. Assessment involves data collection through verbal interviews and collection of vitals and other tangible measurements. While assessing an elderly patient much data is collected form family members, other health professionals and information systems. Whereas, Diagnosis refers to the process of clinical judgment of the health problems or potential problems in the subjects. This phase determines the course of treatment and willingness of the patient to get involved in the process. (Toney-Butler & Thayer, 2019; Pratt & Wijgerden., 2009; Hage, 2014.)

In the planning phase a nurse relates the problems or the risks to the possible and effective goals and outcomes based on Evidence-based nursing interventions. The goals should be specific, patient-centered, realistic, timely and measurable at the

same time. An effective care plan provides a ell-defined care plan for all the professionals involved along with the patients and their family members. A nurse has to explain the care plan, its outcomes to the patients and all related parties so that the maximum participation can be achieved. When these well designed care plans are executed in terms of actions it refers to implementation phase. These actions may be certain treatments, medications etc. The actions thus initiated have to be evaluated against the goals set in the care plan. The evaluation criteria can be generalized into three groups:

- if patient condition has improved
- if patient condition has been stabilized
- if patient condition has deteriorated.

based on these evaluation criteria a reassessment might be needed. (Toney-Butler et.al.,2019; Hage, 2014.)

The demands of modern healthcare has been dynamic which has also affected the roles and responsibilities of the nurses. Primitive information management from pen and paper has shifted to modern day fast performing computers and software. It is the responsibility of nurses to maintain the patient records and information into the systems in a recognized manner. The information has to be maintained in an organized manner which eases the transfer of information between multiples health professionals, departments and countries if needed. Proper information management also helps to identify possible hazards and risks in the patients. (Stonham, Heyes, Owen & Povey, 2012.)

The performance data of healthcare industry is extremely vital at different levels. A care assistant could use the data to provide best physical care to the patients while a doctor could use the patient history to make proper diagnostics. On the other hand, the executive level could use them to make proper decisions to make the organization effective and profitable at the same time. Whereas, the government or other national and international bodies could use the same data in form of statistics to formulate and implement national and global healthcare plans. Most of these data are entered by nurses and the effectiveness of these data depends on the abilities of the nurses. An ineffective and incomplete data entry makes the other professionals

ask the same questions to the patient over and over gain which takes a toll on the patience of the patients as well as a lot of time of the professionals. (Stonham et. al., 2012.)

Teaching and guidance are the very important responsibilities of a nurse. A nurse is responsible for educating the patients about their health status, the risks they are vulnerable to, the demands of their body for the best performance and so on. Apart from education the patients the nurses are also responsible for mentoring the student nurses. A nurse as a mentor encourages the student nurse to develop their skills, competence and encourage independence and balance them against the risks to the patients. A nurse evaluates the learning of the student through assessment processes. It is the responsibility of the nurse to ensure that the student is able to apply the theoretical knowledge into practice and provide feedback to the students as well as the educational institutions wherever possible. the nurse also should make sure that the student slowly builds a sense of professionalism as a nurse during their practice and takes responsibilities and independence. (Clark & Casey., 2011.)

According to Clark & Casey,2011, " The qualities, skills and the attitude of the mentor nurses are more important than learning environment for the student nurses." It means that even in a less ideal environment of care a nurse mentor can ensure a student has a good learning experience. students always look for a role model in their mentors, hence it is important for the nurses to ensure that the students gather proper clinical skills along with professional behaviors. Encouraging independence and gathering evidence based data and practices, providing constructive feedbacks, empowerment are the main responsibilities of a mentor nurse.

Nurses are also responsible for protecting the rights of the patients and make sure that the patients and clients receive proper care without any discrimination based on their age, sex, race etc. The nurses are supposed to educate the clients about their rights, possible options and other legal options in situations where their rights have been violated. In short, the nurses act as their advocates within the boundaries of their profession. It is often regarded as an ethical responsibility of a nurse where the

nurses help the clients to promote their own well-being rather than just merely defending their rights. The patients especially the elderly ones are vulnerable towards any damages or negligence during their stay in a hospital setting. An effective patient advocacy also enriches the nursing profession and the clients or patients trust their nurses more which increases their own participation towards their care and well-being. (Davoodvand, Abbaszadeh & Ahmadi, 2016.)

3   PURPOSE, AIM AND RESEARCH QUESTIONS

The title has been constructed carefully in a way that all the aspects of the thesis and the things, which answers to the research questions are included. As it has been discussed in the introduction part, the falls have been a huge, inevitable crisis in the safe care of the elderly, and there is a need for the nurses and future nurses to understand the falls as a process and know the different parts involved in it. The purpose of this thesis is to use all the knowledge about falls, their causes, risk groups, risk assessment methods and strategies to make the nurses more capable to decrease such falls and falls related injuries. The aim of this thesis is to find out the different risk assessment methods of falls and how as a nurse we can modify the factors that can decrease the chances of such falls and create a safe environment for the elderly. The thesis has been focused on understanding the factors that lead to a possibility of fall so that it can be understood and avoided. Certain diseases are also found to be the cause. But the detail study of those diseases has been avoided to stick to the main aim of the research. The research questions are as follows:

- What are the possible risk assessment methods a nurse can use in assessing falls in elderly?
- How can nurses prevent falls in elderly?

4 METHODOLOGY AND DATA

4.1 Literature review

The method of the thesis work has been literature review. The primary objective of literature review is to summarize and synthesize the available information, which is reliable and has been proved and backed up with facts. In this thesis, as well evidence-based and reliable articles are collected to answer the research question, and to provide solution to the problem on which the thesis is carried out. The main method used was descriptive literature review, which means that the proved facts and data have been studied, understood and presented in a way that answers the question. Meanwhile, certain critical review will also be carried out and personal judgements and understanding based on the evidence-based data are presented (Ward-Smith 2016.)

According to Cronin, Ryan, and Coughlan (2008), literature reviews are described as objective and critical analyses of the relevant literature on the topic under review. Literature reviews are crucial in obtaining evidence-based information, developing policies and academic assessment. Evidence based practice is the key factor in nursing profession. The knowledge or information that is needed in nursing must be evidence based. So, literature reviews help in finding further information about the topic. Moreover, literature reviews provide lots of information needed for our research topic by analyzing the results, which were already explored and provides pathway for further explorations. Literature reviews are considered to be fruitful if able to differentiate between types of literature reviews, how the different terms are used and identifying appropriate literature review (Ward-Smith 2016.)

The original articles, which have been selected using different quantitative and qualitative approaches along with annotated review articles focusing only on the

causes of the falls in elderly, generic literature review where the facts are critically analyzed and presented and integrated review will be used (Ward-Smith 2016.)

There has been a lot of information and research on falls in elderly people. In this thesis, the available information has been studied and analyzed to answer the research questions. The literature review has focused towards finding what are the reasons behind the falls in the elderly people and how nurses can use those knowledges to decrease the falls and make the living environment safe for the elderlies.

4.2   Data collections and analysis

The data collection and analysis were divided into two stages. Multiple online data bases were searched for related articles and journals to the topic. All the articles gathered were taken from evidence-based nursing journals (Cinahl, Ovid, Sage premier, Academic search elite). Initially, the keywords used for the searches were 'falls in elderly', 'falls in nursing homes', 'falls prevention', falls risk assessment', 'nurses' role in prevention of falls' the data gather and analyzed were used in writing the theoretical background and introduction.

The second stage of the data collection was concerned on obtaining the information to answer our research questions. The main information needed were assessment of falls and prevention of falls in elderly. It was also necessary that both, the assessment and prevention strategies found, could be used by a nurse in any setting. Any assessment and prevention techniques, which were above the usability of nurses were excluded in this stage. This data was used to write the main body of the thesis including the assessment and prevention of falls in elderly. Different search words resulted in different results but using masto-finna search engine was simpler as it was possible to add remove multiple search words which were already listed in the search category. Many search terms were included and excluded multiple times to get the best results. The search process was based on using the broader search term initially and using more topic-focused term under the broader term to obtain more

topic related data. The final search terms used were Elderly, Accidental falls, Accidental-falls risk factors, Risk assessment, Falls prevention. The table 1 below explains the process of data search and acquisition.

Table 1: Data search and acquisition

	HITS	
Search words	**Assessment criteria**	**Prevention criteria**
Falls in elderly	73,240	73,240
Inclusion criteria Full text/ English/2008-2018-	45,487	45,487
elderly	4,546	4,546
Accidental falls	1107	1107
Accidental-falls risk factors	164	164
Risk assessment	15	
Fall prevention		40

The articles published only between 2008 and 2019 were taken for the thesis process in both the stages. The whole search process included only the data, which were available for full access for the students and only the data which were written in English language were selected. The articles focusing on certain disease like dementia, Alzheimer's, Parkinson's were excluded. Only the original empirical research were taken, other sources like case studies, comments etc. were not taken. The articles obtained during the search were accessed for relevance and need by reading the topics first. All the data not related to our research questions were ruled out and the abstract of the related data were studied further.

The table 2 below lists out the inclusion and exclusion criteria for the search process.

Table 2: Data inclusion & exclusion criteria

INCLUSION CRITERIA	EXCLUSION CRITERIA
Published in English language	Falls due to medical conditions
Published during 2008-2018	Newspaper articles or comments
With full read access	
Data related to elderly and ageing	
Data with free access	

Finally a total of 28 articles were taken for the thesis. Out of these 28 articles 11 were exclusively taken to write the results part which included answers to the issue of assessment and prevention of falls in elderlies. The other articles were taken to buildup the basic knowledge base of the thesis like definitions of falls, definition of elderlies, most common causes of falls and the roles and responsibilities of the nurses in general.

The main keywords used to obtain the data for the results were 'falls in elderly', 'accidental falls', 'accidental falls risk factors', 'risk assessment' and 'fall prevention'. These terms were used in a hierarchical order as mentioned here and in the table. The main focus of data collection in this stage was to obtain information which could answer the research questions. The finally selected 11 articles were read, compared and contrasted with each other and the sub-headings like frailty, medications, exercise etc. explained in the results sections were obtained. The sub headings of the results were not used as search terms during the process of data collection and acquisition.

5 RESULTS

5.1 Assessment of Falls

According to Barker W.,2013., Assessment of falls as a process of identifying each and every risk factors of falls in the elderlies as any single factor may increase the possibility of falls and injuries.

A thorough reading of 15 articles left the author with 7 articles which extensively focused on assessment of falls in elderlies and seemed relevant to answer the research questions. The assessment techniques and concepts presented here are taken on the basis of intensity of its effects on falls and falls related injuries based on the author's personal judgement.

5.1.1 Frailty

In Joshep, Pandit, Khalil, Kulvatunyou, Zangbar, Friese, Mohler, Fain & Rhee (2015) article the frailty was referred as the weakness or vulnerability in people as a result of increasing age. With increasing age people naturally lose their physical, mental and cognitive abilities. With decline in all these abilities the elderlies at more risk of falling. While not all the elderlies feel the same level of frailty at the same age it is essential to access very individual uniquely for their abilities and vulnerabilities. Age is not the best tool for assessment of the elderlies' abilities, strength and risk of falls, rather frailty index should be used as a substitute for the age. It is also obvious that the frail elderlies are expected to suffer more severe injuries resulted by falls than the non-frailer ones. It is a must to access each and every individual regularly in terms of their muscle strength, balance, flexibility and independence before making a care plan or designing a plan for their daily activities. It has

been seen that very few studies and strategies have focused on frailty as an assessment tool for falls in elderlies.

Moreover Barker W.,2014., adds up that falls are not exclusive result of growing old. The falls are rather results of other ageing influences like reduced mobilities, comorbidity, cognitive impairment. For example, osteoporosis does not necessarily increase the risk of falls in elderlies, but it increases the extent of damage and injuries after falls.

In Shimada, Megumi, Ishizaki, Kobayashi, Kim & Suzuki (2011) study showed that the identification of the frail elderlies, their abilities and limitations help to plan an effective care for them. This identification is essential to formulate the prevention plans which the elderlies could benefit from. The abilities like cognitive impairment, confusion, impaired orientation and misperception of functional abilities can be used as screening tool to identify the frail elderlies. In a residential care setting the nurses have more knowledge about their patients or elderly clients. They know the abilities, limitations, routine and other aspects of the elderlies. Hence the frail elderlies in residential care settings are expected to get better compared to other acute setting or other hospital departments where the elderlies have short stay. For example, a nurse in residential care setting could know if a certain elderly is likely to fall in the bathroom.

5.1.2 Intellectual disability

Falls in elderly population is very common with one out of three elderlies fall every year which is estimated around 0.45 to 0.65 falls per person per year. Among these population the elderlies with ID (Intellectual Disability) are at a higher risk. It has been reported that half of the injuries in the elderlies with ID are caused by falls. With increasing life expectancy, the risk of falls in elderlies with ID is also increasing. The general risk factors for falls in elderlies with ID are similar to general elderly population but ID has been a contributor to the increasing number of falls in the elderlies. The process of ageing is expected to start earlier in the population with

ID. (Axmon, Ahlström & Sandberg, 2018; Smulders, Enkelaar, Weerdesteyn, Geurts, Schrojenstein & Lantman, 2012.)

Some elderlies with ID have certain conditions like epilepsy but more of them have general old age characteristics like visual weakness, medications etc. However, these factors are stronger and more prevalent in the elderlies with ID. For instance, the elderlies with ID often have more medications and co-morbidity. The elderlies with ID are found to incur falls twice than the general elderlies during vital activities like eating, personal hygiene tasks etc. Most of the falls in these elderlies have occurred during normal activities like walking. The severity of injury after falls is also greater in the elderlies with ID as they have lower bone mineral density. The elderlies with ID are expected to get more superficial injuries, open wounds and fractures than dislocations and sprains. Most of these injuries are likely to happen in head and legs. The rate of readmission has also been greater in these group of elderlies. Whereas there has been seen no major difference in the falls rates among men and women with ID. The most common reason of falls during walking was their inability to maintain balance after minute tripping or obstacles. Hence a basic and simple training to avoid tripping and obstacles and maintain balance faster would be beneficial to the elderlies. (Axmon et.al.,2018; Smulders et. al.,2012.)

5.1.3   Medications

At present, with the steadily increasing elderly population and life expectancy the requirements of their healthcare and social-economic care are also increasing. Along with this trend the number of medicines and prescription to those elderlies is also increasing. Many elderlies have been living with some kind of chronic conditions which also has lifted the number of medications consumed by them. The combination of multiple medicines and drugs increases the drug interactions, side effects and lower drug adherence. Generally, the combination of four or more prescribed medication puts the elderlies at a higher risk of falls. There have been many

evidences of the relationship between drug interactions and falls in all group of patients and in case of elderlies the incidences are more frequent (Hekenbach, Ostermann, Schad, Kröz, & Matthes, 2012.)

The study by Karlsson et. al., 2013, highlights the fact that the medicines under the group: psycholeptics, psychoanaleptics, non-steroidal anti-inflammatory drugs and antihypertensive drugs have found to increase the risk of falls in elderlies. These drugs are referred as FRIDS (Fall Risk Increasing Drugs). Various studies have revealed that these FRIDS have contributed to falls related injuries like hip fractures. For instance, Benzodiazepines have been found to be a major risk factor in falls and hip fractures in elderlies. Other various studies have found medications like antidepressants, anxiolytics, hypnotics, sedatives, and antiarrhythmic to add to the risk of falls in the elderlies (Hekenbach et.al.,2014.)

It is essential for a nurse to understand the side effects and interactions of multiple drugs. This knowledge helps the nurses to assess the higher risk groups of elderlies for falls and implement a safer and effective care plan for the elderlies. In addition, the nurses' knowledge of drugs, their side effects and interactions make the whole healthcare system and process safer as the nurses can also figure out any mistakes in prescriptions and medicine distribution. Regardless of the huge research, evidences and updated information on the relationship between FRIDS and falls, the elderlies with FRIDS prescriptions have been at higher risk and vulnerability of falls. With advancement in medicines with less side effects and interactions the risk and incidence of falls is still present at large, but with proper nursing interventions the occurrence of falls in elderlies can be minimized (Hekenbach et.al.,2014.)

5.1.4 Post-fall assessment

The focus of nursing interventions and clinical examinations should be to find out the possible causes of falls and ability to identify the risk groups of elderlies at falls. Along with this is it essential to examine the situation after falls. It is important to

find out the main cause if falls in elderlies rather than making assumptions. A thorough examination of possible factors that have caused falls should be carried out. A near fall also should not be ignored. The underlying cause of fall and its possibility of future re-occurrence has to be studies. This study and examination often reveal conditions or risk factor which was not present in the elderly before and a new care plan has to be designed accordingly. A risk identification scale can be used to access the intensity of the various causes of the falls. It helps to identify the most prominent cause of falls, which requires immediate attention and find out other factors, which might affect the safety of the elderly in future. An incorrect assessment may lead to wrong results which my limit the mobility and increase a sense of fear in the elderlies (Miceli, Ratcliffe & Johnson, 2010.)

The article by Mathon, Beaucamp, Roca, Chassagne, Thevenon & Puisieux, 2017., focuses on the behavioral changes and vulnerability of the elderlies after falls. They further explain that the falls cause a serious damage in the elderlies. The extent of damage reaches their personality and behaviors. Post-fall syndrome (PFS) is a very common and serious issue of falls in elderly and it is considered as a medical emergency. There are no specific tools to detect the elderlies at risk of post-fall syndrome. Hence it is important to assess the elderlies thoroughly to identify any risk of falls. It is also crucial to follow the prognosis of patient with PFS after their discharge from the hospital. It has been seen that the patients with PFS have more chances of vascular dementia, osteoporosis and impaired functionality.

5.2   Prevention of Falls

5.2.1   Exercise

Use of multiple falls avoiding techniques, education etc increases fear in the elderly of falling which may lead to the elderlies avoiding activities and initiating depression. Apart from assisting the elderlies in their daily activities and preventing falls it is essential to motivate and build a sense of confidence in the elderlies to be more

active so that they can live a healthy and happy life. Exercise also helps to prevent and slow down the progression of physical disability in the elderlies (Oh et. al., 2012.)

Exercise has proven to be a very effective solution in preventing falls in elderlies although few studies have focused on reducing the fear of falling. However the research by Horne, Dawn, Skelton, Speed & Todd, 2014 lays out the fact that the elderlies do not take exercise as a preventive measure. Exercise must be tailored to meet the individual needs of every elderly. To lay out these needs each elderly must be accessed individually in terms of his everyday activities, interests, muscle strength, flexibility, endurance, balance agility etc using different tests, observations and interviews. An interview can be used to access the fear of falling so that the exercise program can be introduced gradually in elderlies who have high fear of falling. As the fear is reduced and confidence is developed the intensity of the exercise can be increased. The elderly's health and past falls history must be considered as well. It is essential to develop the interest and commitment towards the exercise program. It requires the elderlies to be well informed and briefed about the exercise program. It should be accessed that the exercise is not harming the elderly's joints, muscles or increasing stress. It is essential for the elderlies to enjoy the exercise. The exercises should focus on building muscle strength, endurance, balance and flexibility. (Oh et. al., 2012.)

The exercises can be custom tailored to fit and suit the individual. The exercise can be focused towards increasing gait balance, confidence, concentration etc. In addition, home based exercises can be introduced which can be performed with ease in the particular home environment without making expensive costs to the change in the environment. (Karlsson et. al., 2013.)

In contrast, the NICE guidelines 2015 which was updated on 2017 focuses more on attributing exercise individually with respect to the abilities and needs of each and every elderly and avoiding group exercises. It further explains that certain exercises may be beneficial to the health of the elderly but not address the prevention or risk factors of the falls. It also says that effect of brisk walking on falls in elderlies has been conflicting and controversial.

A balanced and well costumed exercise has been proven to increase outdoor activities, independency and decrease falls and fear of falls in elderly. It is important that these exercises must be simple and easy to perform so that they can be done at home and alone as well. As the fear of falling is high in winter and the elderlies limit their activities more in winter the elderlies lose their strength and flexibility. Simple indoor exercises help to ensure the elderlies maintain their activities and strength. At other times the exercises could be done alone or in groups. To reduce falls and fear of falls the exercise program must be continuous with frequency of one to three times a week (Oh et al., 2012; Karlsson et. al., 2013.)

5.2.2   Secondary prevention

Secondary prevention refers to the interventions, which are based on the assessment after the falls in the elderlies. A proper post-fall assessment often reveals many causes and conditions, which can be treated or altered to decrease the recurrence of falls. These modifications may be treating the conditions, changing the medications, environmental modification or changing the daily plan of everyday activities in the elderlies. There are multiple strategies and interventions available which could be suitable to the situation. This secondary assessment and prevention have found to be highly effective and has decreased the recurrence of falls by 25%. However, it is necessary that every fall and near falls have to be documented clearly with all the possible details like time, environment and surroundings, intensity and severity of injury etc. (Miceli D. et.al., 2010; Karlsson et. al., 2013.)

5.2.3   Environmental management

Physical and environmental factors like improper lightning, slippery floors, excessive furniture, steep stairs etc. increase the chances of falls significantly. These environmental hazards contribute greatly to the situational risk factors of falls. It is

also important to access the environment if the elderlies are living alone or they have someone to take care of them. The environment should be modified in sch a way that it supports the abilities and daily life activities of the elderly. (Rubenstein, 2016; Karlsson et. al., 2013.)

A home hazard assessment checklist explained in the tables (3, 4, 5) below explain the possible hazards, risks and proper modification to avoid the falls. (Rubenstein, 2016.)

Table 3: Environmental management of general households to avoid falls in elderlies (Rubenstein, 2016.)

HAZARD	PROBLEM	CORRECTION	RATIONALE
Lightning	Too dim	Provide ample lightening in all areas	Improves visibility
	Too direct	Reduce glare with properly distributed light, proper placement off bulbs.	Improves visibility and contrast sensitivity.
	Inaccessible switches	Place switches at the entrance of room, motion sensor lights, night lights or glowing switches.	Reduces chances of tripping or falling against obstacles in dark room.
Carpets, rugs	Torn	Repair or replace torn carpets	Reduces the risk of tripping and slipping
	Slippery	Provide no-skid back carpets	Reduces the risk of slipping
	Curled angles	Tack or tape down the curled edges.	Reduces the risk of tripping and slipping
Chairs, tables & furniture	Obstructed pathways	Remove cutter from hallways, arrange or remove excessive furnishings	Makes movement easier and safer

	Chairs without armrests	Provide chairs with extended armrests to provide leverage while sitting and getting up	Helps in transferring.
Wires and chords	Exposed in pathways	Organize them over the floor or under the carpets or coverings	Reduces the risk of tripping

Table 4: Environmental management of Kitchen to avoid falls in elderlies (Rubenstein, 2016.)

HAZARD	PROBLEM	CORRECTION	RATIONALE
Cabinets and shelves	Too high	Keep frequently used items at waist level Install shelves and cupboards at accessible heights.	Educes risks of falls due to frequent climbing and reaching
Floors	Wet or waxed	Place a rubber mat on the sink area Wear rubber-soled shoes in kitchen Use non-slip wax	Reduces risk of slipping especially with gait disorder.

Table 5: Environmental management of Bathroom to avoid falls in elderlies (Rubenstein, 2016.)

HAZARD	PROBLEM	CORRECTION	RATIONALE
Bathtub or floor	Slippery floor or tub	Install skid resistant strips or rubber mats	Reduces risk or slips and falls
	Need for support	Install bars or grabs	Helps in transferring
Towel racks, sink tops	Unstable use for support	Fasten grabs bars to walls in accessible area	Helps in transferring
Toilet seat	Too low	Increase the height of seat	Helps in transferring from toilet and less knee flexion.

6   SUMMARY OF RESULTS

With the old age the elderlies are gradually expected to lose their different abilities like physical abilities, cognitive abilities, interest etc. This loss of abilities makes the elderlies more prone towards falling. This assessment can be used to identify the abilities and limitations of the elderlies and make corresponding modifications to ensure the safety of the elderlies. The frailty index is a better assessment tool than the age. (Joshep et. al., 2015.)

The elderlies with low intellectual abilities have found to have more chances of falling. The intellectual abilities are also expected to degrade along with age. The elderlies with low ID are also found to have multiple medications which also increases the risk of falls in elderlies. (Smulders et. al., 2012.)

The elderlies generally have multiple health related problems which directly increases the number of medications they use. With multiple medication the elderlies are at a risk of different side effects, low drug adherence and medicine interactions. These factors ultimately increase the risk of falls in elderlies. In addition, certain medications like psycholeptics, psychoanaleptics, non-steroidal anti-inflammatory drugs and antihypertensive drugs have a positive relation with the risk of falls in the elderlies. (Hekenbach et.al.,2014; Karlsson et. al., 2013.)

The elderlies with a history of falls in are also categorized in a high-risk group. The falls can be an unpleasant experience which may decrease the confidence and physical activities in the elderlies. It is very important to carefully study and identify the underlying causes of falls so that the causing factors could be changed to ensure that the falls don't repeat themselves. An effective post-fall assessment lays out the possible prevention strategies without making unnecessary and expensive modifications in the environment and lifestyle of the elderlies. (Miceli et. al., 2010.)

Exercises have been found to be of great benefit in avoiding and preventing falls. It also helps to slow down the process and effects of ageing. Exercise are of different types which focus on muscle strength, balance improvement, flexibility and they also increase confidence and decrease fear of falling. They make the elderlies more active and independent. However, it is important to tailor the exercise to suit the individuals based on their abilities, interests, health conditions, environment and other factors. (Oh et. al., 2012; Horne et. al., 2014; Karlsson et. al., 2013.)

Most of the falls in elderlies are prone to fall within the environment they live in. hence it is important to make necessary changes in the home and surroundings to ensure their safety and ease their daily life activities. The most important modifications must be made in the bathrooms, kitchen, stairs and bedrooms. The things of daily and frequent use should be placed in easily accessible area. (Rubenstein, 2016; Karlsson et. al., 2013.)

It is required to classify the causes of the falls in different categories like environmental, medical, unanticipated, frequency etc. which could be used in making plans and clinical decisions. These assessment results can be used in other situations and individuals as well. It is common that the elderlies fall while the nurses are handling or transferring them. A close assessment of these types of falls helps to design a better and safe handling of elderlies and decreases the chances of injuries to both elderlies and nurses.

7   DISCUSSION

7.1   Discussion of findings

The aim of the thesis was to find out the different risk assessment methods of falls and how as a nurse we can modify the factors that can decrease the chances of such falls and create a safe environment for the elderly. The thesis has presented through study of multiple resources and laid out the possible risk assessment strategies which can be used by a nurse. The interesting part of the study was that the effective assessment process yielded the possible prevention strategies.

Multidisciplinary team members like occupational therapists, physiotherapists, speech and language therapists, nurses are directly involved in prevention of falls in elderly living in different nursing homes. In order to reduce the occurrence of falls and make the living environment safe for elderlies the nurses first need to understand the causes of falls and come up with strategies and activities to reduce the falls. Nurses who participate in caring of elderly people can give awareness education about preventing falls, for instance, they can give information about osteoporosis and its risk. Nurses can also encourage elderly people to do exercises suitable for their body as it helps them to improve posture, flexibility, balance, digestion, ability to cope with pain and improves quality of life. (Mark Allen Publishing Ltd, 2011.)

As falls in elderly is an inevitable the nurses should be transparent and open about the falls incidences and learn from it. The consequences of falls and judgement should not stop them from discussing and talking about it with the co-workers. This discussion helps to find out the cause of the falls, modify the risk factors and ultimately decrease such further incidences in future. (Blake, 2013.)

Falls often results in dislocations, soft tissue damage, fractures and reduce quality of life. Nurses can help elderly people in modification of home hazards which reduces falls like using non-slippery mats, using non-slippery shoes while going out in slippery ice. When elderly people use combined drugs at a time results in excess

of fall rate, so it is necessary to take pay attention in elderly person`s medications. Nurses should try to identify the causes of falls and if the fall is related to medication then immediate consultation with doctor is necessary to prevent further damage. It is assured that multi medication is reviewed and adjusted which helps in reducing falls. (Karlsson, Vonschewelov, Karlsson, Cöster & Rosengen, 2013.)

During the planning of a care plan a nurse should be able to undertake a holistic approach and include potential problems as well as the immediate problems. For example, the nursing interventions to be implemented have to address the food habits, physical weakness or abilities, mental and emotional status etc. Clinical judgement of a nurse is a vital aspect of the planning phase as it helps to select the most effective interventions. In addition the nurse should also be capable to incorporate data and information from all possible parties and use the data effectively. The nurse should be able to scrutinize the relevance of the data as well. (Hage, 2014.)

An effective information system and data management makes it easy to devise a care plan for the elderlies and identify the risk factors based on their history of illness, strength, medications etc. It also makes the collaboration of different healthcare professionals effective as the information can be shared among them. A nurse should be able to use these information along with their knowledge . For example; a nurse should be able to relate the risk of falls in an elderly patient while reading their medication list upon admission of the patient. This would help them to create an effective care plan for the patient.   (Stonham et. al., 2012.)

The nurses are often the data collectors in a healthcare setting. The nurses have to dig through multiple paper works to extract proper and effective data which at times becomes a burden because of other responsibilities of nurses. The information management duties of nurses are often shadowed under other direct care roles like medications. Moreover, the global shortage of nurses leaves the nurses with very less time to enter the data effectively and in detail. The nurses should be trained to enter the data effectively in a globally recognized manner with no scope of misinterpretation of data at any levels. (Stonham et. al., 2012.)

A nurse as an teacher needs to educate all the concerned parties like clients, their families, other healthcare professionals, students about the possible risks and prevention strategies. This discussion also helps the nurses to educate themselves as all the professionals and students always have some knowledge or skills to share. Most of the student nurses first practice place happens to be elderly and retirement homes. Hence, the students learn about different medications as elderlies have multiple medications, their side effects etc. which have effects on falls in the elderlies. If these skills and knowledge become the base of their education the safety of elderlies looks bright in the future. (Casey et. al., 2011; Hekenbach et.al.,2014; Karlsson et. al., 2013.)

The results of the thesis has made clear that every client is unique and has their own unique needs. A nurse should be able to identify every client's unique needs and make out a care plan accordingly. The effectiveness of the care plan has to be evaluated continuously and any changes positive or negative should be noted down immediately. An effective care plan should include all the factors like medications, exercise, nutrition, evaluation etc.

7.2 Ethical considerations & validity

Ethical considerations have been continuously maintained during this thesis process. The articles were taken from some of the renowned authoritative online databases like CINHAL, Ovid, Sage Premier, Science Direct, etc. Information from some other reliable websites like World Health Organizations (WHO) were also included. The author has maintained the principle of beneficence. Proper acknowledgement has been given to the original authors whenever any facts or data has been presented in the thesis from their articles. The data has been presented in my own words without altering the fact the author has presented. Plagiarism has been avoided very strictly. The principle of transparency in terms of the methods used in every stage of research has been used. This transparency has supported the reliability and accessibility of our thesis. Me as the thesis writer will be accountable and be ready to explain about the methods used, data found, researched and the base

and facts on which certain personal judgements are based. No discrimination of any kind has been allowed in selection and evaluation of data (Fouka, & Mantzorou. 2013.)

All the articles collected are evidence based and reliable. All resources have been taken from updated version of articles and from the year range between 2008-2018. However, the most updated and recently published articles are prioritized while importing data from the published date range. The article selection is based on research questions rather than personal interest.

Multiple search terms were used and removed at various stages to yield different results. The results were also sorted in different orders like according date, relevance etc. to get results in order to find answers to certain question. This flexibility made the process of acquiring desired data made simpler. Thus obtained data and information were compared and contrasted in different stages to answer the research questions. The major and common topics of assessment and prevention of falls in elderlies were noted and further information on the topic were searched for. For example, medicines and their side effects were listed as a major risk factor of falls in elderlies in multiple articles. The term medicine was noted as a risk factor and further information on medicines, their effects and side effects, drug interactions and possible prevention methods were searched for in different articles. The data obtained form one articles was compared to another for multiple articles for validity.

8   CONCLUSION, RECOMMENDATION & LIMITATIONS

This research has presented the necessary information a nurse could use to assess the risk factors of falls in elderlies and use the discussed strategies to prevent the falls in elderlies. The nurses are required to use their experience and knowledge along with the assessment and prevention strategies. The information can be very handy for the fresh graduated nurses who want to develop their career in geriatric care. It introduces them

to falls as a big challenge in the care of elderly and the intensity or seriousness of it. The nurses also require knowing the extent of damage that falls do on the different aspects like cost to the family and health department and involved people like the elderlies, their family members, care givers.

It will require the nurse to have a long experience and practice to become an expert in assessment and prevention of the falls in elderlies. Long term work experience, practice, trainings and knowledge would make the nurse's judgements and assessments more reliable. Hence the more experienced nurses must train the newly qualified nurses to understand the assessment techniques and process better. A complete, evidence-based assessment of falls makes the prevention of falls to follow up naturally and efficiently. The nurses' knowledge about different illness, conditions, medications, their side effects and interactions increase and becomes clearer with work experience. Continuous introduction of new medications requires appropriate trainings to the nurses and other health care staffs. An experienced nurse will have the ability to select the most appropriate interventions to avoid falls and maintain safety in the elderlies (Miceli et. al., 2010.)

However, there has been very less research on the use of intuition or the sixth sense of the nurses to assess the risk of falls in the elderlies. An experienced nurse will be able to access the risk of falls an make the necessary modifications to ensure the safety of the elderlies based on their intuition.

There has also been less research on finding out the strategies to ensure the safety of the elderlies who have cognitive impairment. Gradual loss of cognitive abilities

is a natural process of ageing. Hence it is very important to come up with strategies to ensure the safety of the cognitive impaired elderlies. (Axmon et.al.,2018.)

The nurses should be able to find evidence-based information and recognized guidelines to assess the risk of falls, make a care plan, find out effective interventions in every stages of care from primary care and prevention, home care, hospital care and long-term care settings. While providing the care the nurses should keep in mind that the care should cover the physical and mental needs of the elderlies. Ethical standards and patient confidentiality should always be considered. It is also a responsibility of education institutions and teachers to provide the future nurses with evidence based and updated knowledge and skills to work with elderly people. (RNAO, 2017.)

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APPENDIX

Table 6: Articles used in research findings.

AUTHORS, YEAR & JOURNAL	TITLE	AIM	SAMPLE	FINDINGS
Axmon A., Ahlström G. & Sandberg M., 2018. Journal of intellectual disability research	Falls resulting in health care among older people with intellectual disability in comparison with the general population	Investigate falls among older people with ID in comparison with their age peers in the general population.	7936 elderlies with ID over 55 years of age.	Elderlies with ID experience more falls, serious injuries and re-admission than the general group.
Hekenbach K., Ostermann T., Schad F., Kröz M., & Matthes H., 2012	Medication and falls in elderly outpatients: an epidemiological study from a German Pharmacovigilance Network.	Investigate the relationship between fall risk increasing drugs (FRIDS) and the risk of falls.	5124 patients above 65 years of age with at least two doctors visit	Patients with FRIDS and chronic disease were likely to experience more falls.
Horne M., Dawn A., Skelton D., Speed S. & Todd C., 2014. Clinical nursing research.	Falls Prevention and the Value of Exercise: Salient Beliefs Among South Asian and White British Older Adults.	Explore the beliefs elderlies about falls and exercise for fall prevention through in-depth interviews	87 British and south Asian elderlies between 60-70 years old.	In general, the elderlies were not motivated to exercise to prevent falls and did not acknowledge

				the risk of falls.
Joshep B., Pandit V., Khalil M., Kulvatunyou N., Zangbar B., Friese R.,Mohler M., Fain M. & Rhee P.,2015. Journal of the American Geriatrics Society.	Managing Older Adults with Ground-Level Falls Admitted to a Trauma Service: The Effect of Frailty.	To determine greater risk of falls in frail elderlies.	110 elderlies considered frail for over a year above 65 years age.	Frail elderlies have greater risk of fractures and falls.
Karlsson M., Vonschewelov T., Karlsson C., Cöster M. & Rosengen B. 2013. Scandinavian Journal of Public Health.	Prevention of falls in the elderly: A review.	Evaluating falls prevention programmes.		Balance and strength exercise help to reduce falls.
Mathon C., Beaucamp F., Roca F., Chassagne P., Thevenon A. & Puisieux F., 2017. Annals of physical	Post-fall syndrome: Profile and outcomes.	Study patients and their prognosis with Post-fall syndrome.	72 patients hospitalized after a fall.	Certain symptoms and other following diseases and complications were observed.

and rehabilitation medicine.				
Miceli D., Ratcliffe S. & Johnson J., 2010. Western Journal of Nursing Research.	Use of a Post fall assessment Tool to prevent falls.	Identifying underlying causes of falls.		Trained and experience nurses were able to critically examine the falls.
Oh D., Park J., Lee E., Oh S., Cho S., Jang S. & Baik H., 2012. Korean J intern Med.	Intensive exercise reduces the fear of additional falls in elderly people: findings from the Korea falls prevention study.	This study analysed whether exercise programs decrease the fear of future falls in elderly patients who have fallen previously.	65 elderlies who had fallen within a year.	Exercise groups of samples were more confident of not falling.
Rubenstein L., 2016. MSD manual.	Falls in the elderly.			
Shimada H., Megumi S., Ishizaki T., Kobayashi K., Kim H. & Suzuki	Relationship between subjective fall risk assessment and falls and fall-related fractures in frail elderly people.	Examine the risk of falls with specific tasks.	5062 individuals over 65 years old age.	Certain tasks were related to high and recurrent falls.

T.,2011. BMC Geriatrics				
Smulders E., Enkelaar L., Weerdesteyn V., Geurts C., Schrojenstein H. & Lantman V., 2012 Journal of Intellectual Disability Research.	Falls in older persons with intellectual disabilities: fall rate, circumstances and consequences.	Investigate fall rate, circumstances and fall consequences in older adults with mild to moderate ID.	82 individuals with mild to moderate ID over 50 years.	Fall rate was 1 fall person per year which happened mostly when walking with 11.5% falls leading to serious injuries.