



Fall prevention at home among elderly people: A Nursing assistive approach

Nsoh Neville Anye

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Supervisor (Arcada):	Gray Pamela
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<p>Abstract:</p> <p>The incidence of falls, fall related injuries as well as fall associated cost will continue to rise due to the increase in the ageing population. However, falls among elderly people can be reduced or prevented through multifactorial assessment tools and multifactorial preventive strategies. These strategies vary depending on the cause or risk factors that caused it. Elderly people identified to be at high risk should be assessed and screened by trained personnel's. The aim of the study is to research on risk factors for falls among elderly people at home. Alongside the risk factors, the study also aims at finding possible interventions to prevent or reduce falls at home. The study presents a review of selected articles through inclusion criteria. Qualitative literature review was used and inductive content analysis was employed to analyze selected articles and the findings were categorized into the main and sub categories. The Grace Care Model was used. This theory enables the author to achieve the objectives of the study. The study recommends nurses and health workers to consider well established assessment procedure like fall history, medication review, check for traces of cardiovascular or neurological illness, incontinence , vision, postural blood pressure , balance and gait, thorough bone examination to examine osteoporosis risk, assessment of Vitamin D and Calcium intake before any preventive strategy is considered. The study present preventive fall strategies from the risk factor point of view. They were categorized under four headings as follows physical exercise, home environment, medication and education.</p>	
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FOREWORD

I would never have been able to go through this study without the strength from God. I therefore dedicate it to Him, for seeing me through all the difficulties to accomplish my Degree. Thank you Lord.

I would also like to acknowledge my family, teachers and friends for helping me to complete this project. Above all, special thanks my supervisor Mrs. Gray Pamela for her time, support, effort and kindness, in helping me achieving this project.

1 INTRODUCTION

This study reviews articles on falls among elderly people at home. Falls are common in all age group and are caused by a range of factors. It is frequent and re-occurred often among elderly people (Sakamoto et al. 2012). It has been estimated that twenty to forty percent of older people aged 65 falls each year. Fifty percent of the cases require medical attention and one out of ten ends up with bone fracture or other trauma leading to surgery and long-term rehabilitation (Boelens et al. 2013).

In other cases, falls may lead to serious irreversible situation like using the wheel chair for a life-time or psychological distress. Under critical conditions, it can lead to death (Hendriks et al. 2008). In the United State of America, 14,900 deaths were recorded among elderly people in 2004 from injuries related by unintentional falls. As a result, zero point two billion Dollars and nineteen billion Dollars were spent in for direct medical cost due to fatal and nonfatal injuries (Stevens et al, 2006). In addition, the total annual cost of hip fracture resulted from falls among elderly people in the United Kingdom stood at 1.7 billion pounds (Hedley et al. 2010)

However, it may be difficult to predict when fall will occur among elderly, but surely it is easy to determine through assessment tools if they are at risk or not (Deaver & Cote 2013). Therefore, the needs for effective assessment tools are necessary.

This study is commissioned by Loviisa city in Finland to create a conducive and efficient working environment for healthcare workers and older people. As a nurse, it is obvious to assist patients to prevent, promote and restore health using available resources and knowledge acquired through evidence based facts. In relation to this study, the nurse responsibility is to identify elderly people at risk as well as implementing safety measures in the healthcare setting and community as well as to educate elderly and their relatives on how to reduce the occurrence of falls. This research aims to find out the potential risk factors of falls and to establish preventive nursing strategies to reduce falls among elderly people living at home. After the findings nurses should be able to determine and put in practice different ways to prevent falls thereby promoting health among older people. To achieve these, the Grace Care model was chosen as the theoretical

framework (Model) for the study. This Model is chosen because it reflects the core intention of the study which focus on fall prevention among elderly people at 'home'. It is an in-home assessment approach care model theory by a team of healthcare practitioners to develop individualized care plan (Bielaszka-DuVernay 2011). With the implementation of this care model, particular questions should be considered when assessing elderly people at risk.

The author will make reference to elderly people as 'older adults', 'old people', as they all refer to elderly people in the context of this study. Though people are referring to 'elderly people' depending on their community. In Northern Ireland for example old age is attributed to self-identification. They argues that age is relative and advised that chronological age should not be considered a reliable means of deciding who is an elderly (Age Concern Northern Ireland 2007). Other hypothesis supporting this fact states there are '50 year olds' and young '70 year olds'. Putting the arguments together, the author draws conclusion not to consider old age as a homogeneous classification for elderly, rather a more objective consideration as self-identification is preferable (Age Concern Northern Ireland. 2007).

2 BACKGROUND

This section represents an overview of the study with the main objective of letting readers to understand the study. However, the author insists readers should keep in mind it was impossible to review or have access to all articles related to this study.

2.1 Falls

According to The Center for Disease Control (CDC), Falls remain one of the leading causes of death among elderly people accounting for about more than 15,000 deaths. In 2006 only, over 1.8 million emergency rooms visits were recorded and over 433,000 hospitalizations were due to falls (Center for Disease control, 2006). The (CDC) also mentioned that falls among the elderly may lead to destructive health status ranging

from mild to severe injury such as hip fracture or head injury that may require long stay in the hospital. Falls may also leads to psychological pain.

Tousignant et al. (2013) found in their study that older adults who have fallen have 50% chance to fall in the future. This is likely to affect their quality of life in the long run. Some older adult may compromised with the situation and withdraw the number of outings they previously made, consequently decreasing outdoor social activities.

However, for the purpose of proper understanding ‘falls’ among elderly people will be defined. According to the Centers for Medicare and Medicaid Services (CMS) Minimum Data Set (MDS) 3.0 Resident Assessment Manual, defined falls among this age group as a report of a resident who has landed on the floor unwitnessed. It further mentioned that if an elderly person slip or trip or stumble resulting in position change it may be categorized as a fall event even if the fall is prevented due to the resident’s regaining balance or being supported by another person. (Frieson et al 2012).

Due to previous researches, there exist different types of falls. In this case, the adoption of a unique definition is important. For example, elderly people define falls as a loss of balance whereas health care professionals refer to it as an event leading to injuries and ill health (WHO, 2007).

Three main type of falls were identified, accidental, anticipated and unanticipated physiological falls.

Accidental fall refers to an elderly person tripping or slipping to the floor caused by environmental factors. For example if there are no grab bars in the interior of the home, if the floor is slippery because of spilled water and inadequate lightening, if the bed has inappropriate height, or if the walkways are obstructed by stuffs or having rough carpets edges or high door sills. This type is difficult to predict but it can be prevented by modifying the environment for example reduction of slip and trip hazards and proper lighting (Morse).

Anticipated physiological falls occurs if an elderly is identified to be at risk of falls as a result of known physical and physiologic problems referred to as extrinsic or intrinsic factors. These known risk factors are identified through multifactorial fall risk assessment. Multidisciplinary interventions to treat and modify these actual risk factors will

reduce this type of fall. For example complete multifactorial fall risk screening and assessment to determine risk. (Morse).

Unanticipated physiological falls occur because of sudden, unidentified or unexpected medical conditions, such as lack of D vitamins, osteoporosis, heart attack, stroke or seizures that could not be anticipated. Medical management is necessary to eliminate these medical events; however nurses' assessment of changes in conditions and early warning signs does reduce harm impact and impact health care outcomes. (Morse).

2.2 Fall Risk Assessment

On the basis of proper diagnosis and well organized preventive fall strategies, it is recommended to carry on a fall risk assessment on suspected fall risk elderly people. National Center for Injury Prevention and Control of the Centers for Disease Control and prevention (2015) recommends that understanding risk factors may help find suitable solutions for falls accordingly. However, reliable assessment procedure by competent health professionals may decide which interventions are necessary to implement to different people (Kato et al. 2008). This step ensures effective utilization of limited resources. Royal College of Nursing (2004) supported this fact, recommending that elderly people with re-occurring falls or assessed as being at risk of falls should be considered for individualized intervention.

Other significant fall assessment tools such as 'Fall Risk Assessment Tools' abbreviated as 'The FRAT is recommended. It has three sections. Part 1, 2 and 3. Part 1 consists of fall risk status. Part 2 consist of risk factor checklist and Part 3 consists of action Plan. However, Avin et al. (2015) present evidence based recommendations for fall risk assessment among elderly people. They suggest that physical therapist should make sure they provide an individualized assessment for each patient, and it should be within the scope of physical therapist practice that contributes to a multifactorial risk assessment as seen in figure 1 below.

Screening

1. *Physical therapist should routinely ask older adult patients if they have fallen in the previous 12 months.*

Screening should include:

- a. *History and context of falls over the previous 12 months.*
- b. *At least one question about the patient's perception of difficulty with balance or walking.*
2. *For each patient who reports a fall or falls or reports difficulty with balance or walking, the physical therapist should screen by observing for gait or balance impairment. Screening is positive when either of the following conditions is found.*
 - a. *The patient reports multiple falls regardless of balance and gait impairment.*
 - b. *If the patient reports one fall, and a balance or gait impairment is observed.*

Assessment

1. Physical therapists should provide an individualized assessment within the scope of physical therapist practice that contributes to a multifactorial assessment of falls and fall risk. Additional potential risk factors may need to be addressed by the appropriate providers. Assessment should include
 - a. Medication review with emphasis on polypharmacy and psychoactive drugs.
 - b. Medication history with emphasis on new or unmanaged risk factors such as;
 - i. Osteoporosis
 - ii. Depression
 - iii. Cardiac disease including signs or symptoms of cardio-inhibitory carotid sinus hypersensitivity.
 - c. Body functions and structure, activity and participation, environmental factors and personal factors:
 - i. strength
 - ii. balance
 - iii. gait
 - iv. activities of daily living
 - v. footwear
 - vi. environmental hazards
 - vii. Cognition
 - viii. Neurological functions
 - ix. Cardiac function including postural hypotension
 - x. Vision
 - xi. Urinary incontinence.

Figure 1. Screening for fall risk and evaluation of people at risk (multifactorial risk assessment)

Source: Avin et al (2015). Management of Falls in Community Dwelling Older Adults: Clinical Guidance Statement From the Academy of Geriatric Physical Therapy of the American Physical Therapy Association. vol. 95: 815-833.

2.3 Fall Risk Factors

There are lots of existing risk factors that may cause falls or lead to re-occurring falling among elderly people. Therefore, it is important to identify those at risk to be able to optimize prevention strategies. Therefore, thorough risk factor screenings are recommended. Eto (2001) classified fall risk factors under two headings; intrinsic and extrinsic factors. Intrinsic fall risk factors comprise of diseases and physical symptoms while extrinsic factors are mostly environmental.

However, the Center for Disease Control (2008) reports falls prevention cannot be achieved by a single approach, but by combining exercise with other fall risk interventions like medication review, vision screening and correction, education and a safe living environment. It is recommended that fall prevention personnel should familiarize themselves with the cause before moving forward to lay down preventive strategies. For better understanding, the risk factors are grouped under four headings; Behavioral, Biological, socio-economic and environmental risk factors.

2.3.1 Behavioral Risk Factors

Behavioral risk factors as shown above comprise of the use of multiple medications, excess use of alcohol intake, lack of exercise and inappropriate footwear. The use of so many drugs at a time is also a major cause. Such combined use of medications like benzodiazepines, tri-cyclic antidepressants and multiple prescriptions may trigger higher possibilities to fall related injuries (Eto 2001).

A series of side effects due to the use of multiple medications at a time that may lead to the following symptoms such as hypotension causing dizziness, impaired judgment, delirium, blurred vision, anxiety. Elderly people are likely to experience these side effects because of physiologic changes that may occur with aging which affect the pharmacokinetics which includes absorption, distribution, metabolism and elimination of medication (Cameron 2005).

Physiologic changes as humans grow older include; decreased lean body mass and increased body fat. An increase in body fat may cause fat soluble medications to be more extensively distributed and may remain longer in the body than expected.

Elderly people have the possibility of experiencing declining kidney function which can lead to accumulation of medications that are supposed to be cleared by the kidney. If the kidney fails to carry on its function, it will result to toxic. On the other hand, metabolism of some medication can be reduced due to declining liver function, consequently result to toxic as well. Cameron. (2005) quoted Diazepam medicine as a typical example of such medication that is highly affected by pharmacokinetics changes. It is slowly metabolized and slowly excreted by the kidney of elderly people than young people. This may cause the medication to remain in the body of elderly people for long period of time producing high level of sedative effect or confusion and delirium.

Lack of exercise, clearing snow, cleaning top shelves of cupboards may not be a suitable activity for an elderly people. Those of them who are unable to notice changes in physical abilities and insist to embark on activities that do not match their current health situation may fall in the course of doing so. In case where their physical abilities are declining or where their bones are weakening as a result of osteoporosis, it can increase the risk of fracture after falls (WHO 2007).

In the work of Charters (2013), those responsible for the delivery of fall preventive strategies should note that there is no one side fits all solution. Physical exercise program should be directed to individual after taken into considerations their medical conditions, fall history. For example Tai Chi exercise may be effective for those without any previous fall case than those with a series of fall history. Some cause may be due to balance impairment, muscle weakness. Therefore, effective exercise such as resistance training and regular standing position training can correct this case. It should be carried on 2- 3 times a week and must be delivered by a trained instructor.

Another study suggests that falls are common among elderly people because of age related deterioration of balance and neuromuscular system. Falls occur during motor tasks. Therefore, footwear should be a point of interest because it generally influences postural stability. Also, good footwear may prevent the risk of slips, trips and falls. Shoes with low heel are recommended because a high-heel shoe is detrimental on posture, balance and gait. Those involve in the prevention of falls among elderly should advised elderly people to put on thin hard-sole shoes to optimize foot position (Menant et al 2008).

Example of an appropriate home foot wear for elderly with high risk of falls is seen below in Figure 2



Figure 2. Appropriate footwear

2.3.2 Biological Risk Factors

These include age, gender, race, chronic diseases, physical, cognitive and affective decline. There are lots of significant biological changes as someone grows older. Changes in diminished touch and sensation from limbs, muscles and feet, poor hearing, poor balance and dizziness can cause elderly people to fall due to lack of awareness. Chronic neurological illnesses like Parkinson's disease, arthritis, osteoporosis, heart disease and stroke, bowel and bladder incontinence, blood pressure also cause frailty and physical impairment among the elderly (WHO 2007). Disease such as Osteoporosis is typical among this age group. Its symptoms include low bone mineral density and micro architectural deterioration of bone tissue that may lead to bone fragility and an increase in the risk of fracture. People with this disease are likely to break bones in the hip, spine and wrist if they fall.

Chronic illnesses like arrhythmia, postural hypotension, decrease cardiac output, decrease venous return, carotid sinus and hypersensitivity can provoke an elderly person to fall. Often elderly people with stroke fall within a year of their illness (Gillespie et al 2003).

Elderly people with chronic disease are more likely to develop motor sensory functioning, mobility and balance disorders (South Australia. Dept. of Health. Statewide service strategy division 2009).

2.3.3 Socioeconomic Risk Factors

Just like any other cause of falls, socio-economic factor for instance elderly people with limited accessibility to health and social services, low income, very little education and poor housing environments are exposed to higher risk of chronic disease which in a long run leads to falls. This fact is may be true especially as they may not have the resources to afford what is necessary to prevent falls at home (WHO 2007).

2.3.4 Environmental Risk Factors

About 50 to 60 percent of falls among elderly people occur at home. Therefore, planning fall preventive strategies to reduce falls among this age group should consider environmental home hazards as an important point. On the patient's side, Elderly patient at risk who uses visiting nurse should be able to provide opportunities for their respective nurse for them to be able to identify potential fall hazards and take corrective action (Menant et al. 2008)

Environmental risk factors consist of both the individual's physical conditions and the surrounding environment. Hazards at home may not by themselves be the cause of falls per se but the interaction between other factors and their exposure to environmental ones. Some examples of home hazard causes include features like narrow steps, slippery surfaces of stairs, looser rugs, insufficient lighting, obstacles on the hall way, door sills, slippery floors, electric cables, loose rugs and unstable furniture. The absence of walking aids like grab rails, grab bars in the bathroom, living room, no bed rails can cause a fall. To reduce falls in this situation, professionals should consider modifying the environment to suit the need of the individual (Lord et al 2006).

2.4 Previous Research

Lots of research articles have been reviewed in attempting to analyze their contents which are closely related to this study. In the course of gathering data, the author observed that many of the literature agree that preventing falls among elderly cannot be tackled by a single approach. It varies ranging from single intervention strategies to comprehensive multifactorial approaches.

In analyzing previous researches, Costello and Edelstein (2008) presents a review of a randomized Controlled Trial study that aims at finding effective strategies of falls prevention for a community dwelling older adults. They present varieties of intervention such as multifactorial fall intervention program, medication and vision assessment with appropriate health practitioner, Exercise and home hazard assessment. Results show that multifactorial fall prevention programs are more effective for elderly with previous fall history. Also, medication and vision assessment should be done by appropriate health care practitioner if need be. Exercise including comprehensive program combined with muscle strengthening, balance and endurance training for 12 weeks is recommended. Home hazards assessment is vital especially in targeting group of individuals.

A similar study conducted to assess whether a pragmatic multidisciplinary fall preventing approach is more effective than usual care in preventing new falls and functional decline among elderly by Hendriks et al. (2008) found little or no statistical significance favorable effect on falls. Participants who received the complete intervention were compared with the control group and it did not show any form of effectiveness. Participants underwent detailed medical and occupational therapy assessment to evaluate and address risk factors for recurrent falls. Those in the Controlled group received usual care. In usual care, specialist, and hospital physician do not record medical risk and other risk factors for falls such as environmental hazards in the home and patient's risk behavior.

In a study conducted to explore risk factors and strategies for fall prevention among elderly people, found that falls among elderly people are often associated to several risk factors such as weakness, unsteady gait, confusion, postural hypotension, visual disorder and certain medications. To reduce falls in this situation, attention should be geared towards the aforesaid risk factors. According to the article, fall reduction program should involve a systematic risk assessment and targeted interventions. During the assessment process, it is important to obtain a full report of the circumstances and symptoms surrounding the fall. Report from those who witnessed the fall is important as the patient may have poor recollection of the event. Also symptoms experienced near the time of falling may also point to a potential cause. Gait and stability should be assessed by close observation of how the patient rises from a chair, stands with eyes open and closed walks, turns and sits down. Those involved should pay attention to gait velocity and rhythm, stride length, double support time (time spent with both feet on the

ground). Targeted interventions include exercise programs and environmental inspection and hazard reduction programs.

To address fall prevention among elderly, the author suggests discontinuation of medications that has contributed to the fall or those medications that causes undue sedation if necessary. Patients with gait and balance disturbances should be provided with specific assistive devices such as walkers, canes and shoe modifications. Gait training programs under supervision by a physical therapist, individualized to handle the specific underlying causes. Patients with persistent orthostatic hypotension caused by autonomic dysfunction should be exposed to special techniques that includes sleeping in a bed with the head raised to minimize sudden drop in blood pressure on rising, wearing elastic stockings to minimize venous pooling in the legs, rising slowly of sitting on the side of the bed for several minutes before standing and avoiding heavy meals and vigorous activity in hot weather (Rubenstein 2006).

A study by Kato et al. (2008) presents prevention program aim at increasing care giver skills and motivation of staff members through action research. Evidence based facts were considered to support the study and it consisted of staff education , assessment of individual risks, implementation of care adapted to the risk, consultation of family members about fall related problems and modification of care in the case of falls. Empowerment approach was use as the main driving force and feed backs from patients and their relative served as the change agents. In a nut shell, the study concluded that this approach is best for elderly people who require long term care.

They specified that in preventing falls among elderly people, those involves should use the community organization model to create successful strategies because prevention programs cannot succeed without the participation and support of many individuals and organizations. The author argued that fall prevention can be effective if several methods are implemented. Fall prevention according to the author is said to be effective if community organization involves in the process. This can take the form for example by educating professional nursing staffs. This approach is best for reducing environmental hazard risk factors which is often associated with reduced physical activity, osteoporosis and low body mass index. The author believed by educating those at risk, it will help reduce or prevent them from falling. They further recommended a structured educative

lesson for nursing staffs whose main role are to prevent falls among this vulnerable age group.

Kyrdalen et al. (2013) found that home and group exercise targeting muscle strength and balance could yield effective result for those at risk for falls. The study aimed to compare the Otago Exercise Program (OEP), which was first introduced as supervised home training (HT), with Group training (GT) on functional balance and muscle strength among elderly people. A randomized controlled trial approach was used. Two groups were sidelined. The controlled group compared (Group Training) with no or sham intervention group (Home training). Both group received active intervention through the Otago Exercise Program for 12 weeks. The amount of exercise was made to be comparable between the two groups at approximately 90 minutes per week. The balance exercise implemented included tasks in standing, walking, stair-walking and rising from a chair. Also strengthening exercise including ankle weight cuffs to strengthen hip extension. Stretching exercise was also included. Result from the study indicated improvements in functional balance and muscle strength. Self-reported physical health was greater for Otago Exercise Program performed in a group setting (GT) than for home exercise (HT). After the end of the training, there was still an extra effect of Group training than home training. Conclusively, they found Otago Exercise Program performed as Group Training to be more effective in improving functional balance than Home training. All in all, Leijon et al. (2011) suggested being in a group setting motivates a lot to perform exercises more effectively.

3 THEORETICAL FRAMEWORK

This chapter presents ‘the grace care model’ as the theoretical framework of this study. This model is relevant to this study because it recommends an inter-professional team to start addressing falls prevention beginning with a comprehensive in-home assessment. The inter-professional team comprise of a nurse, in collaboration with social workers who are responsible for coordinating care for the elderly. This team provides information to an expanded team led by a geriatrician, a pharmacist, physical therapist, community resource expert, and mental health care manager. This larger team looks into the care plan and refined it based on the GRACE Care protocols. The nurse and social worker meets with the patient’s primary care physician to review the recommended care plan and obtain the physician’s input. Finally, they present the care plan to the patient’s relative or other care providers if need be. Each care plan must meet the needs of the individual concern. In this study where falls is the issue, nurses should teach their patients how to avoid falls and how best to get up from them when it occurs (Counsell et al. 2007).

In the study of Deaver & Cote (2013) falls among elderly people usually leave some negative side effects ranging from minor to major outcome. As such, it is worthy to investigate the different approaches to reduce falls in the future. This can be done through effective, ethical and sustainable health promotion strategies (Davies & McDowall 2006).

Generally, health promotion programs are designed to enhance and maintain functional ability for all to enable individuals live independently for a longer period (Nunez et al 2003). The world Health Organization (1986) defines health promotion as “the process of enabling people to increase control over, and to improve, their health” (Davies & McDowall 2006). Obviously the outcome of health promotion is ‘good health’. The Constitution of WHO (1946) states that good health is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity.

3.1 The Grace Care Model 2005

This theory became operational in 2005 as a result of increasing needs of the ageing population and the desire to improve primary care at home. It was developed by the Hornsby Ku-ring-gai Health Service, a metropolitan hospital in Northern Sydney-Australia. The major goals were to improve the quality of geriatric care so as to optimize health and functional status. To decrease excess healthcare use among elderly (Counsell et al. 2007). This therefore means if an elderly patient needs to be admitted in the hospital, they should allow them have access to rapid treatment to enable them stay shorter in nursing homes than expected. The theory recommends a Grace Support team consisting of nurse practitioner and social worker to meet with the patient in their home to conduct initial comprehensive geriatric assessment. After which they will (nurse practitioner and social worker) later meet with the larger GRACE interdisciplinary team comprised of geriatrician, pharmacists, physical therapist, mental health social worker, and community based services to draw-up an individualized care plan.

This theory encourages health workers to consider treating elderly patients at home than in nursing homes. As it is said that patients treated at home do not need to change their environment or routine or do not need to adapt to a new sociological culture of the hospital in question. Nursing homes are often busy, noisy and it is a confused place for elderly people. The acronym for 'GRACE stands for;

G----- Geriatric

R----- Resources for

A----- Assessment and

C----- Care of

E----- Elderly. (Counsell and Mitchell, 2006).

3.1.1 Assumptions of the Model

The Grace Care model assumes as follows;

- That social workers, nurse practitioner in collaboration with primary care physician should consider in-home assessment and care management in order to provide care at home. If this is properly handled, it will avoid unnecessary hospital admission.
- To reduce the length of stay in hospital.
- To produce a plan headed by a geriatrician in collaboration with a pharmacist, mental health social worker, and community based services.
- To promote extensive use of specific care protocols for evaluating common geriatric conditions.
- To document all details through an integrated electronic medical record.
- To encourage health workers to use web-based care management tracking tool (Counsell et al. 2007).

3.1.2 The Grace Care Protocols

Counsell et al (2007) identified a sets of conditions representing optimal target for quality of life improvement for elderly. These conditions are known as the Grace protocols.

They includes;

- Advance care planning,
- Health maintenance,
- Medication management,
- Difficulty walking/falls,
- Chronic pain,
- Urinary incontinence,
- Depression,
- Malnutrition/weight loss,
- Visual impairment,
- Hearing loss,
- Dementia and
- Care giver burden.

Counsell et al. (2007) suggests implementing the Grace Care model, each patient should proactively be assessed for the above protocols. If any is present, a corresponding Grace protocol should be activated along with specific team suggestions. The first two protocols (Advance Care Planning and Health Maintenance) are recommended for all patients, while the others are considered when necessary. The overall objective of the GRACE Care Model is to decrease hospital admission among elderly thereby, reduce hospital cost. The model stresses instead of being treated in the hospital, a team of health care workers adjoin to facilitate treatment (Counsell et al. 2007) It is an in-home assessment practice by a team of health practitioner consisting of a nurse, social worker to develop individualized care plan for elderly people with chronic health conditions.

4 AIM AND RESEARCH QUESTIONS

The aim of this study is to examine and explore previous literature to investigate potential risk factors and establish preventive nursing strategies to reduce falls among elderly people at home. This research seeks to answer the following questions based on the theoretical frame work. Within the context of the aims, two research questions were derived at;

- What are the possible risk factors for falls among elderly people at home?
- What strategies exist that can prevent falls among elderly people at home.

5 METHODOLOGY

Considering the exploratory nature of the study, a qualitative literature review was chosen. The Grace Care Model theory was used as the theoretical framework to guide this approach. An Inductive content analysis was used for data analysis.

According to Cronin, Ryan and Coughlan (2008), literature review approach is often used to answer well focused questions about clinical practices. To carry on with a literature review, the author should outline the time frame within which articles are selected as well as the method used to evaluate, analyze results of the studies (Cronin, Ryan and Coughlan, 2008; Parahoo, 2006). This characteristic is essential to the readers as it helps to assess the reliability and validity of the study. Also, it presents a precise criteria considered by the author to formulate research questions, set inclusion or exclusion criteria (Cronin, Ryan and Coughlan 2008). Below is a diagram 1 of a literature review process as presented by (Cronin, Ryan and Coughlan, 2008)

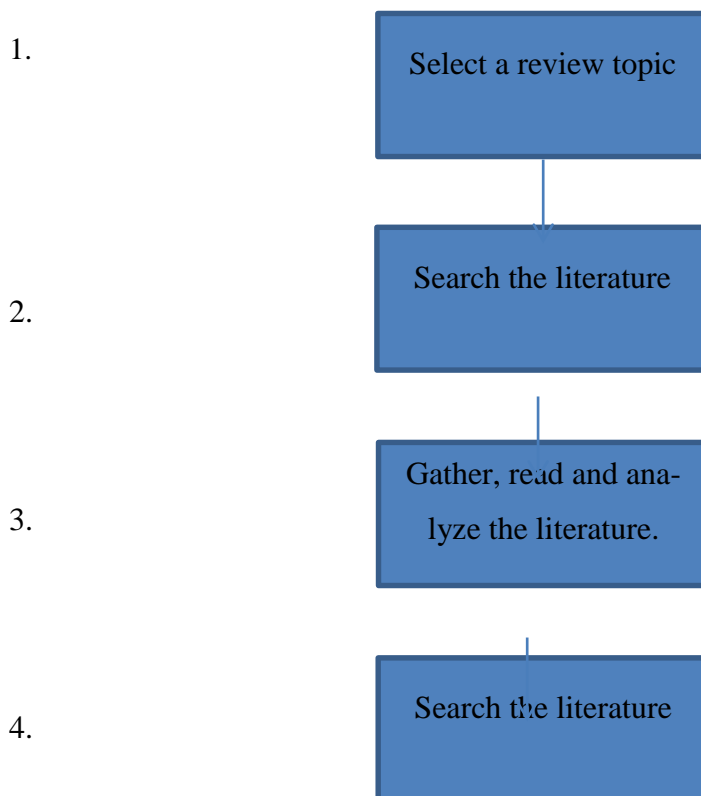


Diagram 1: Source: Cronin, Ryan and Coughlan. (2008). undertaking a literature review: a step-by-step approach. *British Journal of Nursing*, Vol 17, No 1.

The first step to begin with when thinking of using a literature review method is to identify a research topic as shown in the figure above. A recommended approach is to meet and discuss with clinical specialists, read through various research engines. With these put in place, it will enable the researcher in question to discover how much information exist on that particular topic (Cronin, Ryan and Coughlan, 2008; Timmins & McCabe, 2005).

After being sure of the topic for the research study, the second step is to search materials for the topic. It is common nowadays that most researches are being done online through computers and database which offers access to vast quantities of information of which many of it deals with specific area of studies. Therefore, it should be a priority for the individual carrying on the research to properly identify which database is relevant to the research topic (Cronin, Ryan and Coughlan 2008). In this case, different search engines such as Academic search Elite (EBSCO), Nursing collection 1 (OVID), CINAHL (EBSCO), Sage, Science Direct, and Cochrane Library, google scholar were explore to extract articles for the study.

Everything being done and sure, the next step is to analyze and synthesize the literature gathered. It is assumed at this stage that all articles to use for the study have been gathered. Therefore, it is recommended to begin reading the articles in order to grab an idea of what it is about. One way to begin reading is to read through the summary or abstract as this will enable the reader to make concrete decision on whether to continue with the article or not. After the first review, the reader may end up categorizing the articles that are deemed relevant for the research topic (Cronin, Ryan and Coughlan, 2008).

After the appraisal is done, the author should consider how to write and structure the reviews. Organizing materials in an objective manner depending on the respective articles selected and their respective purposes or objectives (Cronin, Ryan and Coughlan, 2008).

5.1 Data Collection

This section shows how information or articles were selected for the study. Considering there is a wide range of previous studies related, it was important to set boundaries in order to avoid confusion and time waste. Relevant articles were accessed from EBSCO, Science Direct; through Arcada Nelli portal and Google scholar. Other general relevant search engine like google.com was accessed as well. Main key words entered include 'Risk factors for falls' AND 'Home' AND 'Elderly', 'Fall prevention' AND 'Home' AND 'Elderly', 'Nursing interventions' AND 'Fall' AND 'Elderly' through EBSCO. 'Fall Prevention' AND 'Elderly at home' through Science Direct and The option 'Full text' was ticked to narrow the search. Fifty articles were found and five were selected because they fit into the inclusion range. The second search words are 'fall prevention' AND 'Home' AND 'Elderly. 'Environmental "risk factors" for falls among elderly' through google scholar. This search was limited to full text and academic journals only through ESBCO from 2005 to 2015. Table 1 below represents a summary of search results and hits.

Table 1. Summary of search results and hits.

Data base.	key words	Year range	Result	Articles se-lected.
Academic search Elite (EBSCO)	‘Risk factors for falls’ AND ‘Home’ AND ‘Elderly’	2005 - 2015	50	5
EBSCO	‘Fall prevention’ AND ‘Home’ AND ‘Elderly’	2005 – 2015	78	5
EBSCO	Nursing interventions’ AND ‘Fall’ AND ‘Elderly’	2005 – 2015	11	1
EBSCO	‘Fall Prevention’ AND ‘Home’ And ‘Elderly’	2005 - 2015	84	1
Science Direct	‘Fall Prevention’ AND ‘Elderly at home’	2005- 2015	40	1
Google scholar	‘Environmental "risk factors" for falls among elderly’	2005-2015	65 800	1

In order to realize a substantial result, an inclusion/Exclusion criterion was set to select articles that could help answer the research questions outlined in the study. Inclusion and exclusion criteria are meant to guide the author select or disqualify articles for the study. It is “ *a combinations of limit that are necessary to focus a research work and pragmatic limitations that are required due to the resources available*” (Aveyard 2007 p 60)

5.1.1 Inclusion criteria

Relevant articles supporting effective strategies to prevent falls among elderly were targeted as well as fall related risk factors. Priority was given to articles that the author(s) had used Randomized Control Trials research type. This is because RTCs research type is considered to produce reliable results (Aveyard 2007 p. 26). Also because the effectiveness of the main theoretical frame used for this study is being evaluated in a randomized, controlled trial (Counsell et al. 2007). Only articles written in English Language were reviewed. The year range for selected articles was set between 2005 to 2015. PDF format articles with abstract, articles which are available in full text were set as the basis for inclusion.

5.1.2 Exclusion Criteria

These represent those articles that falls out of the range of the inclusion criteria. For instance articles written before 2005. Articles not published in English, articles that require payment, nor password, articles with no abstract.

5.1.3 Description of Selected Articles

Fourteen articles were selected. Most of the participants in the studies were elderly people. This section represents a summary description of the articles used as data materials for this study. The description will include the Author's name and year, the title of the article, the aim of the study and the results as shown below in table 2.

Table 2. List of articles chosen for the literature review

Author/Date	Title	Objectives	Results
Article 1 Boelens et al. (2013)	Risk factors for falls of older citizens	It provides an overview of some risk factors for falls among older citizens.	Intrinsic risk factors: balance problem, reactive power, muscular strength and dual tasking, sleep disturbance (difficulty in sustaining attention, slow response times, impairment in memory, decreased in concentration and physical activities. Extrinsic risk factors: bad lightening, slippery floors, inaccessible windows, mobile objects, bad foot wear and clothing.
Article 2 Inattiniemi et al.(2008)	Falls risk among a very old home-dwelling population	To research risk factors of falling in a very old home-dwelling population	Poor mental status, feeling of anxiety, nervousness or fear, difficulty in urinating, poor vision,, use of psychotropic drugs, sedentary physical activity lifestyle,
Article 3 Elley et al. (2008)	Effectiveness of a Falls-and-Fracture Nurse Coordinator to Reduce Falls: A Randomized, Controlled Trial of At-Risk Older Adults	To assess effectiveness of a community based falls and fracture nurse coordinator and multifactorial intervention in reducing falls in older people	This article produces little or less effective interventions. There were no benefits in strength and balance, functional, physical activity, or quality-of-life outcome.
Article 4 Hendriks et al. (2008)	Lack of Effectiveness of a Multidisciplinary Fall-Prevention Program in Elderly People at	To assess whether a pragmatic multidisciplinary fall-prevention program was more effective than usual care in preventing new falls and functional decline in elderly people.	Results showed no statistically significantly favorable effects on falls

	Risk: A Randomized, Controlled Trial		
Article 5 Russell et al. (2010)	A Randomized Controlled Trial of a Multifactorial Falls Prevention Intervention for Older Fallers Presenting to Emergency Departments	To investigate the effect of a referral-based targeted multifactorial falls prevention intervention on the occurrence of recurrent falls and injuries in older people	The study does not support the use of a referral based targeted multifactorial intervention program to reduce subsequent falls or fall injuries in older people
Article 6 Kyrдалen et al. (2013)	The Otago Exercise Program Performed as Group Training Versus Home Training in Fall-prone Older People: A Randomized Controlled Trial	The study aim to compare the Otago Exercise (originally designed as supervised home training exercises meant to improve muscle strength and balance) with the same program performed as group training	The Otago Exercise performed as GT is more effective for improving functional balance, muscle strength and physical health, but not fall efficacy and mental health.
Article 7 Sakamoto et al. (2012)	Fall Prevention Using Olfactory Stimulation with Lavender Odor in Elderly Nursing Home Residents: A Randomized Controlled Trial	To investigate the effects of Lavender olfactory stimulation intervention on fall incidence.	Lavender olfactory stimulation may reduce falls and agitation among elderly but further research is recommended confirms the findings.
Article 8 Hedley et al. 2010	Staying Steady: A community-based exercise initiative for falls prevention	To establish a sustainable preventative exercise program targeting older people at risk of falls.	Participants make a long term commitments to exercise to maintain the benefits gained during the intervention. Social support was found to promote long term adherence to exercise was

			highlighted by the participants' desire to continue to exercise as a group.
Article 9 Erkal, S. (2010)	Home safety, safe behaviors of elderly people, and fall accidents at home.	It presents home safety measures and safe behaviors against fall accident. Of elderly people living at home.	Averagely, participants responded that sufficient illumination of rooms and corridors and safe access to the toilet at night could guaranteed safe home environment.
Article 10 Logghe et al. (2009)	Lack of Effect of Tai Chi Chuan in Preventing Falls in Elderly People Living at Home: A Randomized Clinical Trial	To evaluate the effectiveness of Tai Chi Chuan in fall prevention in elderly people living at home with a high risk of falling.	After 12 months, no lower fall risk in the Tai Chi Chuan group was observed than in the control group.
Article 11 Broe et al. (2007)	A Higher Dose of Vitamin D Reduces the Risk of Falls in Nursing Home Residents: A Randomized, Multiple-Dose Study	To determine the effect of four vitamin D supplement doses on falls risk in elderly	Adequate vitamin D supplementation in elderly could reduce the number of falls.
Article 12 Larsson et al. (2010)	Falls prevention through community intervention – A Swedish example		Preventing falls in all of the local community could be more cost-efficient than preventing falls only among the groups diagnosed with high-risks of falling. The strategy requires a view of prevention which is focused on remedial action; risk reduction through the elimination of hazards in the built environment and the design of safe living conditions for all.
Article 13 Lord et al. (2006)	Home environment risk factors for falls in older	It examines the role that environmental hazards play in increasing the	The research fund that falls at home occurs as a result from an interaction between

	people and the efficacy of home modifications	risk of falls and evaluates the efficacy of environmental interventions to reduce falls.	environmental stressors and physical abilities or risk taking. To best target home hazard reduction it is recommended to focus at those with fall history and limited mobility.
Article 14 Avin et al. (2015)	Management of Falls in Community Dwelling Older Adults: Clinical Guidance Statement From the Academy of Geriatric Physical Therapy of the American Physical Therapy Association.	To provide recommendations to physical therapists to help improve outcomes in the identification and management of fall risk in community-dwelling older adults.	Recommendations include screening of a history and context of falls over the previous 12 months. At least one question about the patient's perception of difficulty with balance or walking.

5.2 Data Analysis

At this stage, the next step is to analyze selected articles for the study. Content analysis technique was used to analyze and understand selected literature. Content analysis method is based on existing theories and practices, knowledge of expert, previous researches (Krippendorff 2004, p 173). It is “*a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use*” (Krippendorff, 2004, p. 18). Content analysis enables researcher to categorize words into fewer categories (Elo and Kyngäs 2008).

It may be used qualitatively or quantitatively and data may as well be analyzed inductively or deductively. If there is not enough previous information or hypothesis about the topic, inductive approach is recommended (Elo and Kyngäs 2008). The author settled for an inductive qualitative approach.

In an inductive content analysis, data gathered are usually grouped to reduce the number of categories by collapsing those that are similar or dissimilar into broader higher categories. The aim of categorizing inductively is to classify data as belonging to a particular group. Data categorization is meant to increase understanding and to generate knowledge (Elo and Kyngäs 2008). An inductive analysis approach begins with organizing qualitative data by opening coding, creating categories and abstraction.

Organization of articles was done by opening codes, creating categories and abstraction. By opening code, the author wrote down important text alongside the articles while reading (coding). Written text or signs were later shifted to generate sub-categories and those points reflecting similar idea were grouped into generic categories. Moving from sub-categories to generic categories, the generic categories were further separated and grouped under higher concepts or themes called the main category as in table 3 below. (Elo and Kyngäs 2008).

5.3 Ethical considerations

The study as already mentioned is commissioned by the City of Loviisa. The topic was further approved by the governing body in charge of Academic and scientific writing in Arcada University of Applied science, Helsinki. A competent supervisor was assigned to supervise the author achieve the goal of the study. Irrespective of previous knowledge about the topic of the study, the author put forth a realistic approach rather than an idealistic approach. A systematic research approach was chosen. Private information about the project was kept private. In situation where the author had to mention them, it was done so anonymously. Arcada guidelines in writing thesis serve as the role model approach to put the study through. All articles and books used were rightly quoted, words to words expression from related previous studies or books copied were put in quotations and credits was given to original author by mentioning names, date and in some cases the title of the article. Recommended database were used (EBSCO, Science Direct, Google scholar).

The author read the rules as outline in the Helsinki declarations which serves as a statement of ethical principles necessary for health care professionals doing research in health and social fields involving human subjects. (World Medical Association declaration of Helsinki 2000). The author seeks the consent of past students graduated from Arcada who wrote on similar topics to read through their thesis. The essence is to make sure the entire process yield reliable result.

6 RESULTS

Fourteen articles were selected to answer the research questions of the study through reliable and recommended search engines. Each article presented something new. All articles selected recommends assessment or screening as the first step to prevent falls. According to the Theoretical frame (Model) of this study, an inter-professional team is recommended to carry on more comprehensive assessment which should produce effective result in reducing falls among the elderly. Inter-professional team consists of nurse, social workers, physical, psychological cognitive and behavioral experts (Counsell et al. 2007), (5, 14).

6.1 Fall Risk Factors among Elderly

Three main categories were identified to answer the first research question, intrinsic, extrinsic and behavioral. Intrinsic factors relate to the human body, the extrinsic factors relate to the environment and the behavioral risk factors relates to behavior and activities of the individual (1). The main categories and sub categories according to the finding are seen below in table 3.

Table 3: Showing categories of Risk factors of fall amongst elderly at home.

Category 1: Intrinsic Fall Risk Factors	Category 2: Extrinsic Fall Risk Factors	Category 3: Behavioral Fall risk Factors.
Bad sight, History of specific diseases, Urinary incontinence, Psychological problems, Medication, Balance, Muscular strength, sleep disturbance, dual tasking, Nutritional deficiency	Time of day (afternoon), Excessive demands, location, slippery floors, bad lighting, in accessible windows, thresholds, mobile objects, furniture, improper assisting devices, bad foot wear and clothing.	Physical inactivity and fear of falling, Risk taking behavior, hurrying, walking, standing.

6.1.1 Intrinsic Risk Factors

Intrinsic risk factors are inconclusive, unsupported, relevant but non amendable or relevant and amendable. Inconclusive embodies dependency activities of daily living, gender, and osteoporosis. Unsupported intrinsic risk factors embody Limberness, Hearing, and alcohol. Relevant but non amendable embodies increasing age, orthostatic hypotension, osteoarthritis, bad sight, incontinence, psychological problems, history of specific diseases and medication. Relevant and amendable embodies balance, reactive power, muscular strength, sleep disturbance and dual tasking. (1, 2, 5, 14). In addition dual tasking involves walking and performing an attention demanding task. Common contributors to sleep disturbance such as the need to urinate, thought that generate anxiety

or distress, noise and pain. Sleep disturbance can result to day time sleepiness, difficulty in sustaining attention, slow response times, impairments in memory and concentration or decreased performance. All these can increase the risk of falling (1).

Other study suggests risk of falling increases with age and gender; nine out of ten falls related injuries in Sweden are sustained by women over the age of 65. Fall risk is associated with osteoporosis, low Body mass Index and smoking. Chronic diseases that affect the musculo-skeletal system and dementia represent increase fall risk (12, 8). Elderly people who take more than four medications at a time are likely to fall than those who don't. Such medications such as antidepressant medications, anti-hypertensive drugs, benzodiazepines and diuretics (10). Benzodiazepine and non-benzodiazepine can contribute to residual daytime sleepiness and other side effects such as psychomotor impairment, amnesia and sedation (1). Similar study suggest dizziness and poor balance associated with medication for as ischemic disease, depression and incontinence as well as sedative can directly cause falls in a hazardous environment (12).

6.1.2 Extrinsic Risk Factors

The Extrinsic factors are mostly environmentally related. This category can be amendable or not amendable. According to article 1 the relevant and amendable risk factors are excessive demands, location of the building, slippery floors especially the bathroom, kitchen. Bad lighting, inaccessible windows, thresholds, mobile objects, furniture that are not properly altered for the person for instance if the seat of a chair is too low, it can cause difficulties when standing up, improper assistive device, bad footwear and clothing. While the relevant and non-amendable embodies change in living conditions (1, 13). Also the absence of handrails in staircase and the presence of uneven floors, unsteady furniture, in adequate ventilation, obstructed walkways (1, 9, 13)

6.1.3 Behavioral Risk Factors

Behavioral risk factors relate to physical inactivity and fear of falling, risk taking behavior (Larsson et al. 2010). Elderly people's attitude of taking risk is associated to fall risk factors. More vigorous elderly people are more likely to take part in risk taking behavior

such as standing on an unsafe supports to change light bulb (13). Inappropriate risk taking behavior such as rushing to get to the door or getting up to use the toilet at night, and inadequate lighting (1, 9). According to article (1), two types of behavioral risk factors exist; behavior that causes a fall and activity at the time of the fall.

Examples of these are physical inactivity and fear of falling, hurrying, standing or lowering. However, relevant behavioral risk factors are physical inactivity, fear of falling. Inactivity due to deficiencies in lower limb strength and fear of falling can cause this physical inactivity (1). Other risk factor found is the lack of Vitamin D. According to article 11 a suggested intake of 800IU is recommended to increase daily requirements especially for those with low level Vitamin D (11).

6.2 Fall Prevention Strategies

From the articles selected, it was difficult to settle on particular preventive strategies. However, a multifactorial intervention seems to produce reliable results but may interact so that each intervention is less effective than when used singly (3). The core of the study is fall prevention. It is therefore obvious that an analysis of the selected articles yielded a lot of main categories on this aspect. The main findings under this category were grouped under five categories. Physical exercise, home modification, medication, Education, Nutritional interventions.

Many people lose their strength and endurance as they age. Lose muscle mass (sarcopenia) faster whenever there is a period of inactivity such as a hospitalization and bed rest. The weakness that accompanies sarcopenia can dramatically increase the risk of falls for older adults, and one-half of all accidental deaths among people over the age of 65 are related to falls. Therefore it is very important to maintain muscle mass for independence, mobility and normal walking speed by paying attention to both nutrition and physical activity. It is important to consume an adequate amount of protein evenly throughout the day. . Muscle growth requires adequate protein intake and exercise. Studies have shown that consuming 20 to 30 g of protein or approximately three to four ounces of meat or high protein foods (depending on your body size) three times a day can help in-

crease muscle growth both in the young and old. Protein containing the amino acid leucine provides additional benefits. Consuming more than 30 g of protein at one time is not beneficial. Adding exercise along with the protein is needed to maximize the muscle growth and strength. The best response is when protein foods are consumed 60-90 minutes before exercise or a protein beverage consumed up to 60 minutes after exercise. (Parker).

Table 4: showing main category of fall preventions among elderly.

Category 1:	Category 2:	Category 3:	Category 4:
Physical exercise	Home Environment.	Medication	Education
<ul style="list-style-type: none"> - Balance - Walking - Gait - Strength, - Tai Chi Chuan - Otago exercise program. 	<ul style="list-style-type: none"> - Poor lighting. - Loose rugs. - Clutter. - Inadequate hand rails 	<ul style="list-style-type: none"> - Polypharmacy. - Psychoactive drugs. - Medication history. - Lavender odor. - Vitamin D intake. 	<ul style="list-style-type: none"> - Counseling. - Provision of environmental hazard checklist. - Foot wear - Hip Fracture - Trained personnel to carry on the task.

6.2.1 Physical Activities

Several elements of physical activities were identified such as occupational, sports, conditioning, household or other activities which involves bodily movement produced by skeletal muscles. Evidence from the articles selected recommends that physical therapist should be able to provide individualized interventions that address all positive risk factors within the scope of physical therapy Practice. Strong recommendations on these includes strength training that is individualized prescribed, monitored and adjusted by an appropriate trained health professional, walking program that conveys health benefits like brisk walking, though not recommended for community dwelling women who are postmenopausal or have a history of fracture. Gait training programs combined with strength and balance training are recommended for community dwelling women over the age of 80 years. Those who demonstrate unsteady gait or require walking aid are refer to see a physical therapist (5, 8, 14). However, it is recommended that fall prevention can be effective if the whole community is involve, promotion of partnership between existing services to achieve shared vision.

A range of exercise programs which targeted balance and provide ongoing exercise were identified. These include the Tai Chi Chuan and the Otago exercise. The Tai Chi Chuan is targeted especially for elderly persons with limitations in balance and mobility. It is a traditionally Chinese medicine and consists of a series of movement that are performed in a slow and flowing manner. It involves focused interaction between the mind and the body. According to the study, it was hypothesized that balance, physical activity and functional status would improve and that blood pressure, heart rate will be at rest and fear of falling would lower in intervention group than the control group. However, the finding of this article shows no effective beneficial effects of Tai Chi Chuan on reducing falls incidents in elderly people living at home. Despite the benefits of the Tai Chi Chuan exercise, there is uncertainty about the effect for those with high fall risk (10).

The Otago exercise program includes task like standing, walking, stair-walking, and rising from a chair. Strengthening exercises used ankle weight cuffs to strengthen hip extension and abduction, knee flexion and extension. The program also includes squats and stretching exercises conducted by a physiotherapist. This exercise was proven to be effective to improve balance and muscle strengthening at a sufficient dosage in group

training. However, whether exercise is performed as group training or home training, it should be decided with considerations of the primary aims of the training and individual's preferences and circumstances (6).

6.2.2 Home Environment

Home environment prevention is best targeted at those with a history of falls and limited mobility, and may require concomitant training. Most falls at home usually occur due to the interaction between the environmental stressors and physical abilities or risk taking. However, the environmental condition is more important because it is possible to avoid falls by improving the home environment for elderly (9, 14). When targeting falls prevention through this dimension, it is important to consider re-modifying the home like adjusting the room or room corridor if it is untidy, check the room light if it is sufficient at night as per the individual's vision. Check the surface of the house if it is flat and safe, or not slippery. Confirm if the elderly can reach the toilet safely at night, check if the bathroom is safe. In a nut-shell, home modification is very important because most elderly people spent most of their time at home. Re-modify the environment by taking in consideration if the hand rails are adequate to support them while walking inside (9). It is important to consider that elderly people should have a high competence level to cope effectively in an environment with high demands, whereas an elderly person with a low competence level will be able to cope with an environment with low demand. For example, the subject of the absence of grab rails would not be considered a hazard if the subject has no difficulty with bathroom transfer (13)

6.2.3 Medication

It was interesting to discover that medication can contribute to falls through different mechanism. Certain classes of drugs such as benzodiazepines, hypnotics, antidepressants, major tranquilizers and cardiac medications can be particularly problematic (14). Patients who take diuretic drugs may experience increased urgency and fall in the process of rushing to the bathroom of changing their gait while rushing to avoid incontinence. Visual changes may take place with anticholinergic medications and neuroleptics, leading to an increased risk of falling. Recreational drugs use such as alcohol can

affect balance and judgment (14). The use of multiple or inappropriate medications concurrently at a time should be avoided. However, this excludes preparations that include more than one drug. Discontinuation of medications that causes postural hypotension or undue sedation is important whenever possible (14).

Other study recommends the use of Lavender oil odor as a non-medicinal intervention for fall prevention. It is an essential oil obtained by distillation from the flower spikes of lavender plants. Its fragrance are known to calming and relaxing the human body. It is hypothesized and it is used in aromatherapy as a relaxant, has multiple ameliorating effects on fall related risk factors among the elderly. Lavender is described as therapeutic for insomnia, headache, migraines, anxiety, nervousness, and melancholy. It has soothing properties affecting anxiety and agitation underlying behavioral and psychological symptoms of dementia (BPSD). Such BPSD like physical nonaggressive behavior including pacing and wandering and aggressive behavior leading to increases in prescription of neuroleptic medications may lead to an increase in fall risk. This herbal plant odor may prevent falls among the elderly by ameliorating behavioral and psychological problems and consequently reducing the need to prescribe psychotropic medications thereby ameliorating gait and balance disorders. The Lavender olfactory stimulation was administered through a patch attached to the inside of the resident's clothes near the neck. It is recommended that daily use of Lavender patch is associated with lower incidence rate of falls at home. Also because Lavender is thought to have soothing properties, it is logical to assume it may also affect the anxiety and agitation that underlie behavioral and psychological symptoms of Dementia (7)

Vitamin D and calcium have an essential role in bone metabolism but Vitamin D also contributes to improved muscle function. Active Vitamin D functions as a hormone, and its main biological function is to maintain serum calcium and phosphorous concentrations within the normal range by enhancing the efficiency of the small intestine to absorb these minerals from the diets. Elderly who take 800IU of Vitamin D are consistent with fall reduction as in a Swiss randomized trial study. Benefits from supplementations are most likely to be seen in elderly who have Vitamin insufficiency or deficiency. Recommended dose to reduce falls is 800 IU. However this is just one piece of fall preventive approach (11).

6.2.4 Education

Counseling and educating elderly patients on measures to reduce the risk of falling is recommended. This recommendation was identified on fair evidence that these measures reduce the likelihood of falling. These measures include exercise (particularly training to improve balance, safe related skills and behavior, environmental hazard reduction and monitoring and adjusting medications (1, 14). It was noticed that fall prevention programs include health education and health promotion materials about reducing falls hazards (3, 5). However, it was realized educational material alone is not enough to produce satisfactory result (2). Most of the articles found recommended home hazard checklist that can be used by the caregiver or the nurse to help elderly persons identify fall hazards and to suggest corrective action for example eliminating tripping hazards like clutter and loose rugs, adding stair railings, improving lighting, adding non-slip floor surfaces and installing grab bars in bathroom if necessary. Checklist should be given to elderly residents to assist them assess personal and environmental risk and take preventive action including behavioral changes. (1, 8, 9, 12, 13, 14).

7 DISCUSSION

The purpose of this study is to identify fall risk factors and nursing assistive approach to prevent falls among elderly people at home. According to the findings, it is recommended that fall prevention is a public concern that needs everybody's input (14). It is a devastating act that may result to serious injury such as hip fracture or head injury that will require long term hospitalization. Fear of falling was noted as one of the risk factors and may lead to self-imposed activity restrictions that may not accelerate physical decline but contribute to social isolation, loneliness and loss of independency (Hedley et al 2010). Fall related injury risk is associated with osteoporosis, low Body mass Index. Chronic diseases may affect the musculo-skeletal system (Larsson et al. 2010). Therefore, preventing falls is economically beneficial and humane. (Hengameh & Nooshin 2008).

However, effective fall prevention programs require public participation. Caregivers or healthcare workers should raise public awareness informing the community of the danger. Community education projects should be organized to teach caregivers to be aware of potential risk factors (Hendriks et al. 2008). Elderly residents should be offered face-to-face instruction to be able to identify risk factors (Hengameh & Nooshin 2008).

Elderly people should be monitored and those taking more than four medications at a time, feeling of dizziness, experiencing poor balance, are associated with medication such as ischemic disease (Larsson et al 2010) depression, and incontinence or living in an organized environment should be screened. Medication like antidepressant medications, anti-hypertensive drugs, multiple psychological medications and benzodiazepines and non-benzodiazepines should be avoided if possible (Boelens et al 2013).

It was interesting to identify that age is a risk factor for falls among elderly people and the risk of fall increases with age.

Physical exercise is a very important preventive strategy that appears frequently in the literature of the study. Elderly people who engage in moderate physical activity live healthy and maintain independence. Regular physical exercise is recommended because it prevents onset of functional decline and improved balance and mobility (Day et al. 2002). The community should offer exercise programs at home, supervised by a trained personnel. As per the findings, appropriate exercise like Tai Chi Chuan, Otago exercise, strengthening exercises combined with balance training exercise (Logghe et al. 2009).

Risk taking behavior like climbing ladders, standing on unsteady chairs or bending while performing activities of daily living, rushing with little attention to the environment or not using mobility device such as cane or walker may expose them to high risk of falling (WHO 2007). In this situation, elderly residents should be educated on their current biological changes caused by the ageing process. Counseling caregivers, elderly and their relatives of the repercussion of taking risk to do certain activities may be an option.

Elderly residents should consume a balanced diet meal rich in calcium, protein, essential vitamins and enough water. Evidence by Tuck and Francis (2002) recommends dietary calcium and regular intake of vitamin D 800IU daily to improve bone mass especially for those with low bone density.

Special concern should be focused towards women. It was found that women are likely to fall and sustain fracture of their age and may require long stay in the hospital or frequent emergency visit than men (Stevens et al. 2006). This is possible because most elderly women use multiple medications and are widow living alone. Environmental hazards coupled with other risk factors such as poor vision or having balance problem contribute greatly to fall related injuries (Erkal 2010).

7.1 Discussion of Findings Related To Theoretical Framework

To embark on a successful fall prevention program among elderly people, the Grace Care Model recommend caregivers, health care professionals, should begin with an in-home assessment to identify possible risk factors and it should be conducted by a geriatric nurse and a social worker in collaboration with the primary care physician. This study is about elderly people living at home, therefore, it is essential to use a theory that directly relate to the content. The goal of the theory is to improve quality of geriatric care at home by optimizing health and functional status of elderly people, decrease excess healthcare use and prevent long term nursing home placement. For instance, the United Kingdom estimates the cost of fall related injuries to be 981 million Pounds per year. In addition the total annual cost of hip fracture has been calculated as 1.7 billion pounds (Hedley et al. 2010).

The Model insist each patient suspected of fall risk should be proactively assessed and if one of the Grace care Protocol is identified, a corresponding Grace team should be assign to follow up the situation (Counsell et al. 2007).

It requires extensive use of specific protocols for evaluating and managing common geriatric conditions such as proper documentation, the use of web base tracking tool and later integrate with affiliated pharmacy, mental health, hospital, home health and community based service (Bielaszka-DuVernay 2011).

In the course of analyzing articles for the study, the Barthel Index , Mini-Mental state Examination (MMSE), Cohen- Mansfield Agitation Inventory (CMAI) were identified to measure participant's functional, cognitive, behavioral and psychological abilities respectively (1,2). Other assessment tools like the Frenchay Activity Index was used to measure actual activities of daily living a patient have undertaken recently and in the past (4). Fall risk for Older People in the community (FROP-COM) to measure the number of falls risk factors for example previous falls, balance, independence, activities of daily living. Geriatric Depression scale Short Form use to identify depression with older people, Modified Falls Efficacy Scale, Body Mass Index and assessment for postural hypotension (5), Berg Balance Scale Index to measure balance (6), Home Hazard assessment to evaluate environmental safety (3), Medication review with emphasis on Polypharmacy, medication history with emphasis on osteoporosis, footwear, vision and urinary incontinence (3, 4, 11, 13, 14).

It is interesting to find out that the Grace Care Model supports meeting patients in their homes to conduct an initial comprehensive geriatric assessment led by a GRACE support team.

According to the Findings most of the articles reported the prevalence of risk as the first step to begin with when assign to prevent falls among elderly people. Most of the risk factors found are supported by the theory's protocol as seen below;

Difficulty Walking.

Memory Loss.

Urinary Incontinence.

Depression.

Malnutrition/weight loss.

Chronic pain.

Visual impairment.

Health Maintenance.

Advanced Planning.

Medication management.

Caregiver burden. (Bielaszka-DuVernay 2011).

8 CONCLUSION

According to the findings of this study, it is obvious that all factors are proven to be significantly increasing fall risk among elderly people in both the community and homes. Common risk factors are muscle strength, balance, dual tasking and sleep disturbance, home hazards, wrong use of assistive devices and bad footwear, hurrying, risk taking, physical inactivity and fear of falling. Other symptoms were identified to be relevant caused by underlying risk factors such as mobility problems, gait problems. Relevant risk factors should be used to identify opportunities for prevention measures for older people (Boelens et al 2013). Older people suspected of fall risk should be assessed and screened by an inter-professional team as guided by the theoretical framework of the study. However it is inconclusive to rely on a single preventive measure since there are a vast range of risk factors. Combined preventive strategies can produce effective and positive results that is Multi-factorial falls risk assessment and intervention is a way to achieve better effectiveness in the prevention programs. Therefore a multi-factorial falls risk assessment and management program are the most effective component or strategy.

8.1 Strengths, Limitation and Recommendations

As already mentioned above this study research was conducted using an inductive content analysis. According to Hashemnezhad (2015) inductive content analysis requires organization of themes, categorization from the data through the researcher's careful examination and constant comparison. Therefore since this study is done based on this method, text content related to the research question were properly interpreted and classified.

This study has been based on a single methodology approach, further research including interview, observational case study could produce a better result. Articles directly related to the study could not be accessed because most of them require some sort of subscription that includes payment per page of for full article. This difficult led to the review of only articles which requested no password. However, reviewing available articles was a difficult task due to the constant increase in the number of scientific publications through new technologies. This imply that a manually conducted literature review becomes an increasingly time consuming (Koukal et al. 2014). Though the author specified a vast range of period for search publications that is 2005 to 2015, the results gotten after each hit contributed little in terms of finding the right article.

No single preventive approach can reliably identify older people at increased risk for falls; rather multifactorial and feasible approaches can primarily produce good results. Most effective components of multifactorial risk assessment should include evaluation of balance and mobility, vision, orthostatic or postural hypotension as well as review of medication use and home environment. A follow -up team should be assigned to see through the process.

It is recommended that Fall Risk assessment should be done often. Multi-component interventions that include staff education programs, gait training, advice on using assistive devices appropriately, and reviewing and modifying medications, especially psychoactive medications.

Hip protectors helps to prevent hip fractures from happening so it is very important to be worn by the elderly in case of any fall.

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