

Accidental Falls Amongst the elderly: Health Impact and Effective intervention Strategies

Bachelor of social services and health care, Geronom (YH)

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<p>Abstract:</p> <p>Accidental falls has many risk factors and interventions. Preventing fall is extremely important in elderly care because elderly people are at high risk of falls. The purpose of this study is to raise awareness on the consequences of falls which undermines well-being amongst the elderly population. The research questions used for the study are: “How do accidental fall affect the well-being of the elderly” and “What are the effective intervention strategies for preventing accidental falls amongst the elderly”. The theoretical framework used for this study was World Health Organization’s “Active Ageing”. Qualitative methodology was used in the examination of data. A deductive content analysis research method was used for the study and ten scientific articles were used as the data materials. The results indicated that accidental falls affect negatively social, economic, physical and psychological well-being of older people who have experienced accidental fall. The results also indicated that interventions such as physical exercise training, medication review, education schemes on falls, vision assessment referrals and surgery, home hazard assessments, nutritional supplements, footwear and hip protection intervention, and specialist check-up were effective in reducing the rate as well as the risk of accidental falls within the elderly population. In the discussion, issues such as gender differences in the risk of fall and creating awareness about the impact of fall were raised. It was concluded that, effective interventions to prevent falls must be individualized, multi-factorial in nature and should be planned by an inter-professional team. It was recommended that rehabilitation after fall should be both mental and physical. Doctors should consider strongly side effects of medication before making prescription to elderly people.</p>	
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<p>Tiivistelmä:</p> <p>Riskitekijöitä kaatumistapaturmille on monia, ja koska iäkkäillä on suuri riski kaatumistapaturmiin, on erittäin tärkeää ryhtyä toimenpiteisiin kaatumistapaturmien ehkäisemiseksi. Tämän tutkimuksen tarkoituksena oli luoda tietoisuutta iäkkäiden kaatumistapaturmien seurauksista jotka heikentävät iäkkäiden hyvinvointia. Tutkimuskysymykset tähän tutkimukseen olivat: Kuinka kaatumistapaturmat vaikuttavat iäkkäiden hyvinvointiin? Mitkä ovat tehokkaita menetelmiä iäkkäiden kaatumistapaturmien ehkäisyksi? Tämän tutkimuksen teoreettisena viitekehystenä käytettiin Maailman terveysjärjestön (WHO) ”Aktiivinen ikääntyminen” toimintatapa viitekehystä.</p> <p>Tutkimusmenetelmänä käytettiin deduktiivista sisällönanalyysiä ja tietolähteenä käytettiin kymmentä tieteellistä artikkelia. Tulokset osoittivat, että kaatumistapaturma vaikuttaa negatiivisesti sosiaaliseen, taloudelliseen, fyysiseen ja psyykkiseen hyvinvointiin iäkkäillä jotka ovat kokeneet kaatumistapaturman. Tulokset osoittivat myös, että toimenpiteet kuten liikunta, lääkityksen läpikäyminen, koulutusohjelmat kaatumisista, mielikuva-arviointi läheteet ja kirurgia, kodin vaaratekijäarviointit, ravintolisät, jalkineet ja lonkkasuojat sekä specialistin tarkastukset olivat tehokkaita tapoja vähentää kaatumistapaturmien määrää iäkkäiden keskuudessa. Keskusteluosiossa on nostettu esille kysymyksiä esimerkiksi kaatumistapaturmien riskitekijöistä eri sukupuolten välillä, sekä kaatumisten vaikutusten tietoisuuteen tuomisella.</p> <p>Todettiin, että tehokkaat toimenpiteet kaatumistapaturmien ehkäisemiseksi tulee tehdä yksilöllisesti, koostuvat monista tekijöistä ja tulee suunnitella moniammatillisessa ryhmässä. Suositeltiin, että kuntoutus kaatumistapaturman jälkeen tulee olla niin psyykkistä kuin fyysistäkin. Lääkärien tulee ottaa erityisesti huomioon lääkityksen sivuvaikutukset ennen lääkityksen aloittamista.</p>	
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1. INTRODUCTION

An American opera singer famously remarked that “In youth we run into difficulties. In old age difficulties run into us” (Wakin 2005). This wise saying adequately captures the rarely talked struggles that come with old age. Globally, the elderly constitute a minority, yet a very sizeable part of the population. Generally considered as the least productive segment of the population thus more or less a burden, many of their plights are often neglected or ignored. There has also been a corresponding neglect on research that directly affects their lifestyles and well-being.

Be it as it may, apart from childhood, old age is the period when humans need the most attention and assistance from mankind. One of the perils inevitably associated with old age is the risk of accidental falls and its consequences at the very worst, brain damage or death. A recent study has illustrated that accidental falls are now one of the leading causes of injury-related deaths in elderly homes across the western world for persons over 65 years (Steinweg 1997).

According to Todd & Skelton (2004) the sudden increase in accidental falls is as a result of people living longer especially in the Western world with many seniors who are now older and frailer. Another explanation for the vulnerability to accidental falls experienced by the elderly is the fact that at old age, most people are already exposed to one or more physical residual effects, such as bad vision, body weakness, loss of balance, fragile bones and complications or side effects emanating from multiple medications (Feder et al 2000).

Research reveals that survivors of accidental falls, often end up losing self-confidence and developing what can be termed as ‘fear of falling syndrome’. That is, they tend to either restrict or refrain from basic exercise and normal activities for fear of falling again. The alarming statistics about the rate of accidental falls makes it imperative for one to examine fall prevention strategies. Such a study would be vital on at least two main counts: ensuring quality health care to this very vulnerable segment of the population and helping policy makers and health personnel reduce the rate of falls.

1.1 Motivation

Motivation for this study came into existence after the author had witness so many accidental falls among the elderly in the institutional home during practical training. The author felt that, if nothing is done about such frequent occurrence, the trend will continue to grow due to increasing in elderly growing population. The author had previously read many articles about the trend at which accidental falls are devastating to the elderly population.

Having witnessed these devastating effects on the clients, the author is convinced that, elderly falls are not to be taking for granted. Falls among the elderly 65+ are frequent in occurrence and can result in admission to the hospital with hip fractures, fear of falling, disability, diminished functional capacity and the worse of all, death. Many risk factors associated with falls are modifiable. Environmental factors, diseases, drugs and their side effects, and behavioural factors can be modified to prevent falls (Kallin et al 2004). An elderly who has fallen once or twice is likely to fall again unless proper interventions are taken to prevent it.

Accidental falls and fear of falling have a lot of considerable implications on an elderly well-being. Implications such as lifestyle changes resulting in decreased mobility and activity, increase dependency affects the quality of life (Salkeld et al 2000). This thesis seeks to illustrate that with better awareness and effective intervention strategies, many accidental falls can be avoided.

1.2 Relevance of the study

Accidental falls among the elderly living in the nursing homes are the main incidents responsible for considerable morbidity, immobility and mortality amongst the elderly. Many of these falls risks are modifiable with proper awareness and measures. The motivation to create such awareness and possibility of preventing their occurrences stirred the interest on this topic.

The author who is working among the elderly knows how devastating accidental falls can be to the elderly population in the elderly homes and institutional settings, and as such felt that his knowledge about the topic can save people's life when applied.

2. BACKGROUND

The background of this study consist of existing literature on the subject, the aim and research questions, the scope and magnitude of this work. It is very difficult to define accidental fall, this is because some elderly person tend to describe it as a 'loss of balance' whereas health care professionals refer to it as 'an event leading to injuries and ill health' (WHO 2007). As such, any operational definition must have explicit inclusion and exclusion criteria.

WHO defined fall as unintentionally coming to rest on the ground floor or other lower level, excluding intentional change in position to rest in furniture, wall or other objects (WHO 2007). Basically, everyone experience a fall from time to time but to the elderly of 65year and over, accidental fall is a major complex health issue threatening the independence, quality of life and overall well-being of the elderly.

According to Waleed (2006), falls are the most geriatric syndrome; they are the leading cause of death, injuries and disability amongst the elderly. According to Lund (2006) researcher for the EUNESE (European Network for Safety among Elderly), 1 out of 10 elderly is treated at the emergency department due to accidental fall. Emergency department treatment alone amount to 8 million injuries in EU and EEA. In EU alone, accidental falls amounts to 75% of all the elderly treated at the hospital.

In the United States of America, 16% of all emergency department visits are due to elderly falls related, 3 out of 10 of elderly over 65 years fall each year. After hospitalisation, 2 in 10 elderly fall victims needs home health care assistance during the first month after discharge from hospital. And 5 in 10 elderly fall victims needed help getting out of bed. About 90% of all hip fractures are caused by accidental falls and only about 50% of those who have experienced hip fracture recover back to normal state, (Perrin 2007).

The increase in ageing population is being viewed as a triumph of humanity but also a challenge to society. WHO estimated the number of persons over 60 years worldwide to be 688 million in 2006. This figure is projected to increase to almost two billion by 2050 (WHO 2007). This means that, more elderly people would be subjected to falls in the near future unless intervention to reduce risk factors and preventive measures are proactively set in place.

Risk factors include behavioural, environmental, biological, and socio-economic factors. Behaviour risk factor comprises human action, emotions and daily choices. These behaviours such as multiple medications, excess alcohol use and sedentary behaviours can be modified through strategic interventions. Environmental risk factors are interplay of individual's physical conditions and surrounding environment. Biological risk factor is the characteristics of individual human body (for example age, gender, physical, cognitive and affective capacities). All these factors according to the EUNESE evidence based good practices has shown that it is possible to reduce injuries by 38% through cost effective methods (Lund 2006).

Eliminating and/ or reducing the injuries resulting from accidental falls amongst elderly people can improve their quality of life and social well-being. This can also reduce or lessen the high health care cost and expenditure due to injuries in this age group. Health care cost for an elderly who has experienced fall affects negatively the economy situation of the elderly, their families and the community in general. WHO (2007) estimated that, the average healthcare cost per elderly fall in Finland and Australia were (\$ 3,611) in 2001-2002. Besides that, the impact that it creates rendering a family member who is working to become a full time caregiver creates societal productivity losses.

Even though accidental falls among the elderly has not been a topical issue in health discourse, a number of scholars have in recent years nonetheless brought the topic to limelight. One of such authors is Janice Morse, who recently classified different types of falls into: accidental, anticipated psychological falls and unanticipated psychological falls (Morse 2008). Upon analysing a set of variables, two scholars found that the risk of injury, calamity, disability and even death is worse amongst the elderly than any other age group including children (Kannus & Khan 2001). Others have observed that those who have fallen in the past are more prone to suffer the ordeal anew, mostly but not ex-

clusively because of their psychological effects that is the fear of falling syndrome (Debra 2011, Lord et al 2007)

Todd & Skelton (2004), on their part have dwelled principally on the risk factors of falls. They have demonstrated that victims on heavy medication are more susceptible to psychological trauma than those not under any medication or just minimal intake. Using a trial sample of 163 elderly people in Australia, Barnett and co-researchers on their part, examined the effectiveness of a community based initiative, and concluded with certain strategies to avoid falls. This included active exercises, socialisation and emotional control (Barnett et al. 2003).

A research conducted by one elderly accidental falls researcher in Finland concluded that, sleeping disorder is another factor causing many accidental falls among the elderly. Sleeping disorder is not normally a part of growing old but because of pain from other diseases and side effect of medication, insufficient sleep causes tiredness, inaccuracy in activities of daily living, and mental psychological imbalances (Pajala 2012).

Many researchers pointed out about the gender differences in fatal accidental falls with men being the highest risk but the trend changed in (2012) in Finland. Current gender statistics on accidental falls in Finland is illustrated in the Figure 1.

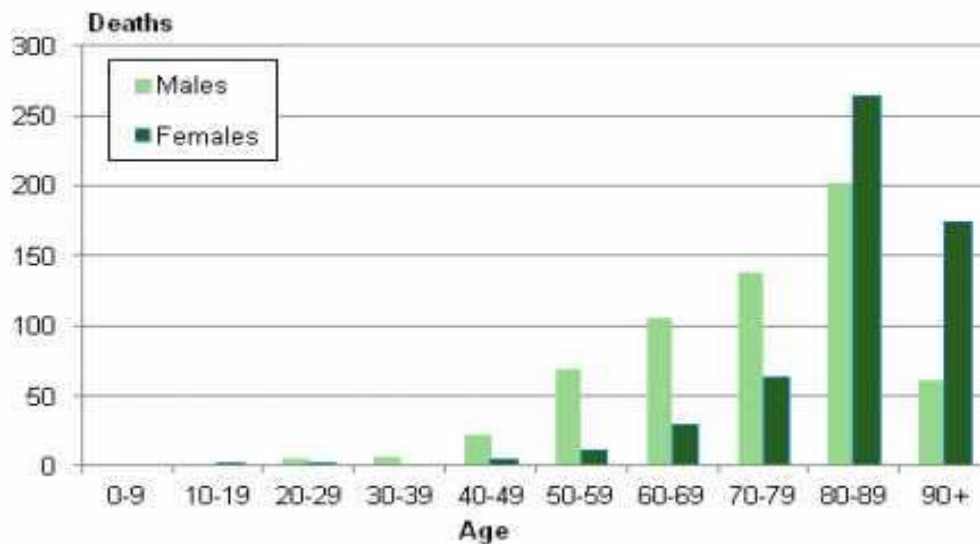


Figure 1: Age distribution of persons that died from accidental falls in 2012, (statistics Finland 2012).

In reference to figure 1, men were leading in fatal falls until 79 years. The trend changed from 80 years with sudden increase in women fatality with the reason being women living longer. According to this figure, in 2012 alone, stumbling fatal falls was the direct cause of death of 902 people and indirect cause for 770, mostly over 70 years of age in Finland, (Statistics-Finland 2012)

According to (WHO facts sheet 2012) in western world alone, about 1.6 million elderly over the age of 65 become victims of accidental falls annually, about 76% are treated and released from emergency department and about 24% are hospitalized because of the severity and consequences from the fall. Even though only 1% dies instantly from falls, there are also millions of elderly that falls without reporting because of minor injuries. WHO estimated yearly accidental falls to be 37.3 million people globally in which 80% of them are from low and middle income countries. Among them, 424,000 dies, mostly the elderly over 65years are worse affected (WHO facts sheet 2012, p. 344). After going through all the previous studies, the author decided to concentrate on raising awareness about consequences of falls which undermine the well-being amongst older people. From this the research aim and questions were set.

3 AIM AND RESEARCH QUESTIONS

Accidental fall is the second leading cause of death among the elderly in the western society, (Statistics-Finland 2011). Injuries caused by falls are the most common reason for fatal accidents. By identifying the reasons behind the falls and the consequences that follow years after the falls may contribute greatly to their prevention measures. For this reason, the author who has witnessed so many occurrence of falls among the frail victims- the elderly; felt that it is important to raise awareness about the effects and consequences of accidental falls among the elderly. It is even more important to devise effective prevention strategies to curb or delimit their further occurrences. However, can accidental falls and injuries be prevented?

The aim of this study is to raise awareness on the consequences of falls which undermines well-being amongst the elderly population. Furthermore, the author strives to suggest proving ways of preventing falls and their further occurrences among the elder-

ly. The author believes that elderly falls should be strongly addressed by elderly care professionals and must be confronted forthright. While examining existing facts and statistics on the subject, the author intends on the one hand to point out the gravity and consequences of falls and also to suggest more grounded scientific methods of preventing further occurrences of fall amongst elderly people.

The research questions of this study are aimed at realizing the aim of the study. Thus they are closely tied together. The research questions are:

- 1) How do accidental fall affect the well-being of the elderly
- 2) What are the effective intervention strategies for preventing accidental falls among the elderly?

Active Ageing

This study employs “Active Ageing” framework by World Health Organization as a theoretical framework for this study. The author’s interest in chosen such framework is that, it seeks to promote the well-being in all aspect of the elderly globally. It also outlines measures and factors causing accidental falls among the elderly and possible intervention strategies to reduce their occurrence.

Active Ageing as WHO (2002) puts it, is the process of increasing opportunity for health, participation and security in order to optimize well-being among ageing people. Fries (2012) argued about the words ‘Active Aging’ being use to qualify for over all well-being of the elderly. According to him, Active Ageing seems to focus more on the component of physical health. Instead, he suggested the use of “Healthy Ageing” since it comprises the improvement of physical health, mental health and social health (Fries, 2012).

The World Health Organization through promoting active ageing for the elderly has indicated that, assuring quality health care for the elderly uplifts a nation, not just health wise but moreover as regards its socio-political, socio-economic and cultural optimization. The benefits of healthy ageing, otherwise known as active ageing cannot be under-

scored. An effective health policy that caters for the health of the nation ensures better standard of living, higher life expectancy and employment for all involved in every health sector and associated disciplines.

Active ageing fall prevention plan is aimed at making progress in reducing the impact of accidental falls among the older people all over the world in order to increase their well-being (Yardley et al. 2006) (cp.ProFaNE). In order to ensure this, WHO (2002) developed a specific strategy for building prevention models for better fall prevention internationally. Included in the model are: Creating awareness about the importance of fall treatments and prevention; improving assessment of environment; individual and societal factors that contributes to the likelihood of falling; and to design appropriate and evidence based intervention strategies to reduce the number of falls among elderly persons (Chang et al 2004).

In order to promote health and well-being of the elderly throughout the world, WHO launched a new health and ageing program aiming at the importance of lifestyle factors, healthy ageing through combination of training, advocacy and research. WHO (2002) Active ageing allows the ageing elderly to realize their potential for physical, social, and mental well-being throughout the life course in order to participate in society, while providing them with adequate protection, security and care in time of need (WHO 2002).

Active ageing according to the world health organization may depend on different varieties of influences and determinants that surround elderly individuals, families and communities that under-minds and prevents the well-being of the elderly. These include: Behavioural, physical environment, personal, gender and cultural, social, access to health and social services, and economic.

In other words, an effective health policy has the dual impact of promoting quality health care and drastically reducing risks for all the constituents of a country (WHO 2002). The health of the elderly like the rest of the population is crucially dependent on a number of components: behavioural, social and economic. Behavioural determinants presuppose that the elderly are drilled towards sound behavioural lifestyle for their own upkeep. This includes engaging in light physical exercise where possible, healthy eating

habit, avoiding smoking, drinking (alcohol), and respecting the right medical prescriptions (WHO 2002).

As mentioned earlier, there are numerous determinants of active ageing as related to accidental falls in old age, which under-minds the well-being of the elderly. These may include cross-cutting determinants like culture and gender. There have been many researches to support the fact that elderly women over 65 years are more prone to fall and suffer hip fracture than elderly men, whereas elderly men suffers fatal falls compared to elderly women, (Campbell et al 1990).

The social determinants involve the elderly engaging in sound social habits. That is, socializing with peers at elderly homes, having good communication with practical nurses, literacy activities such as following current news, reading and sharing information. In effect, it implies exposure to others in order to avoid loneliness and distress (WHO 2002).

The economic determinants call for a better scheme to reduce poverty and to increase or involve the elderly in a working environment within a society. Environmental responsibility is synonymous to being economic friendly (World Health Organization 2002). Activity being undertaking during the time of fall may also contribute to its factor, intrinsic or extrinsic. Most falls happen as a result from combination of environmental hazards, excessive risk taking, carelessness and disabilities.

Personal determinants of active ageing in relation to elderly falls are: Attitude, coping with falls, fear of falling, and most likely, race and ethnicity. Falls may also result in a post fall syndrome according to the WHO global report on falls prevention in old age (WHO 2007). Other factors can also be behavioural, that is healthy eating, physical activities and use of medication. The author intends to deepen the knowledge about the use of medication, gender and culture to narrow his research.

The reason why the author decided to choose WHO (2002) “Active Ageing” the theoretical framework is that, it seeks to promote overall well-being of the elderly. The frame work encourages elderly people to become aware of their potentials for physical, social, and psychological well-being throughout their life course. This would encourage

them to participate and contribute to the society and on the other hand, provide them with security, protection and care when they need (WHO 2002).

4 ACCIDENTAL FALLS

Under this heading, the following issues are going to be examined: factors causing falls amongst older people in Finland; and consequences of falls. The reason for examining these issues is to understand most important aspects promoting falls and what category of people are vulnerable to falls. The concept of well-being shall also be examined under this heading.

4.1 Accidental Falls in Finland

Finland is a country of about five million people, with its healthcare system generally considered to be over the average in the world According to (WHO 2000). It is expected way better than most other countries in the world. Finland, “shows most regards for ethics and transparency in both the public and private working sectors” Kunad (2013). It has a safety index of 67.31 and average age of 79.41. Its good quality health system, high education standard coupled with high standard of living has enabled the country to be one of the best countries to live (Kunad 2013). To better understand the causes of falls in Finland it is important to look at the ratio of fall between elderly men and women as well as environmental factors and the role that medication plays in falls of older people.

This fact notwithstanding, the country has also been faced with a critical challenge containing the high rate of injuries and deaths resulting from accidental falls amongst the elderly. The statistics are staggering. In just 2011 alone 2,766 people died from accidents, of which 920 were women and 1846 remaining others, men. This constituted 6% of all deaths in Finland. Consistent with the previous years before 2011, over one half of the recorded accidents in women and a third of the accidents in men emanated from accidental falls (Official Statistics of Finland 2011).

The rate of falls also increases with age with men 85 years and over being the highest risk group. From the year 1969 to 2009, the rate of fatal fall for men has drastically reduced even though it is still higher comparatively to women of the same age group. This shows that, gender plays important role in falls prevention, (Kannus et al 2005)

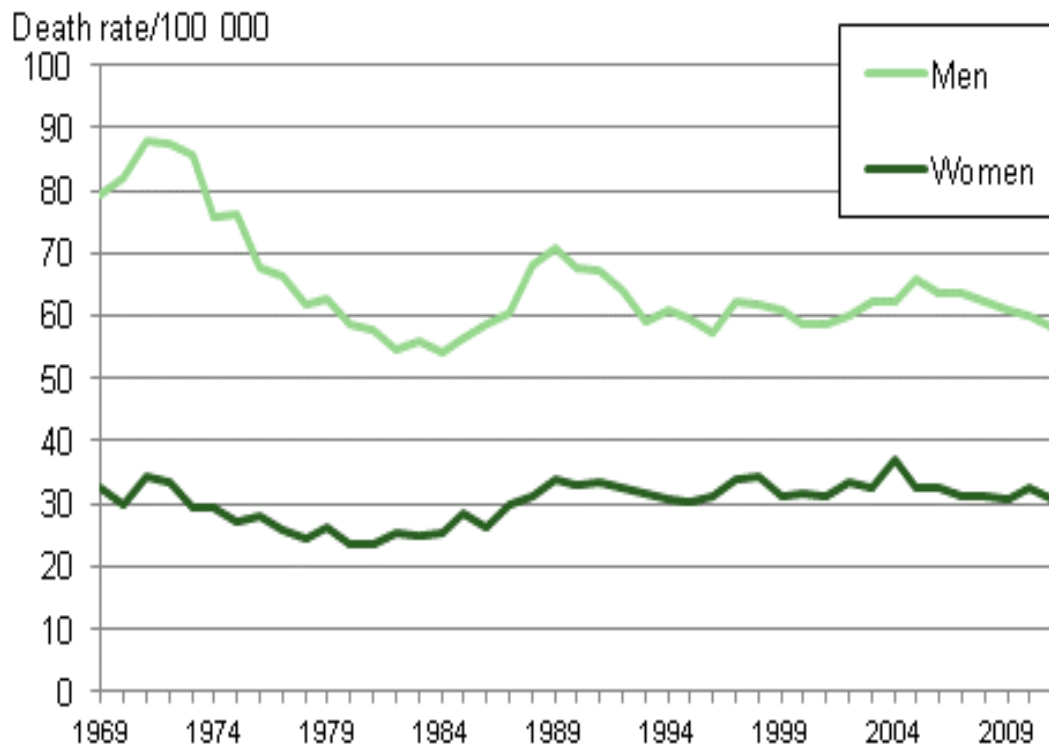


Figure 2. Accident mortality from 1969 to 2009. (Official Statistics of Finland (OSF): Causes of death 2011).

Figure 2: shows that, fatal accidental falls in men are higher compare to that of women. One of the determinants for active ageing is gender. Gender plays important role in implementing falls preventive measures. Falls in general are more common in elderly women than men but falls related fatality is higher in men than in women. For this reason, policies and programs for falls prevention need to reflect on gender perspective (Rubenstein 2006).

A breakdown of a similar report in 2009 showed that of all the deaths recorded in Finland in that year, 34.2% amongst women were from accidental falls, whereas in men it represented an even higher percentage of 55.5%. The problem of gender fatality in acci-

dental falls is not only confined in Finland but western world in general. A similar statistical table 1: the total fatal fall rate by age and gender per 100,000 elderly in USA.

Table 1: American society of consultant pharmacist; National fall prevention action plan (2003) Modified. (Fick 2003)

AGE GROUP	MEN	WOMEN
65-69	10.6	5.4
70-74	16.0	9.5
75-79	34.0	19.1
80-84	63.9	41.4
85+	153	106.4
Average	42.0	26.8

It is very clear with reference to table 1 that, gender plays important role in dealing with accidental falls prevention. It is not only gender issues but the risk of falling also increase dramatically with age. The fatal rate doubled from 80 years and over compared to 65-74 years old group.

Different disciplines have proved the fact that, it's not just gender differences but also racial difference affect falls. It has been well documented that being a white elderly male and over the age of 80 years have the highest rate of fatal falls, followed by their black counterpart male (Stevens & Dellinger 2002).

4.2 Accidental Falls and Associated Risk factors

As already noted, old age comes with physical vulnerability. The decline in physical strength often degenerate into lack of balance and physical stability which in turn causes occasional falls amongst the elderly. A fall can be defined as an unfortunate event which results in a person inadvertently stumbling to the ground or floor. Given that one

falls to the ground or floor either unintentionally or in a state of unconsciousness, the consequences of the act (for example, susceptibility to injuries, accidents, shock) are accordingly beyond the control of the victim. This is even more so when the victim is an elderly person (WHO facts sheet 2012).

One author has eloquently defined an accidental fall as falling all the way to the ground or floor, or falling and hitting an object such as a chair or the stair: “when the vertical line which passes through the centre of mass of the human body comes to lie beyond the support base and correction does not take place” (Feder 2000). An accidental fall can be intrinsic (when the accident directly affects postural control) or extrinsic (where the main cause of the fall is as a result of environmental factors).

Risk factors on the other hand, are a transcendence of accident prevention. It is the study of preventive techniques that can be employed to govern the prevention of falls amongst the elderly. Risk factors can be summed up into three categories to wit: intrinsic factors, extrinsic factors and exposure to risk. Intrinsic risk factors analyses the history of falls, the circumstances of falls and its associated risks. Extrinsic factors on the other hand study the size and environmental causes of accidental falls. Finally, exposure to risk aims at establishing the nexus between incidences of fall and associated risks. It also seeks to establish the category of persons with highest risks (Deandrea et al 2013).

Risk factors can be modifiable and non-modifiable. Non-modifiable factors include old age itself, past history of falls, gender and race. Modifiable factors include gait and balance problem, lower body weakness, psychoactive medication, chronic diseases such as history of stroke, Parkinson diseases, arthritis, vision and hearing impairment. Even though osteoporosis is not a risk factor, it might increase the risk of hip fracture after a fall (Dolinis et al. 1997).

Accidental fall prevention refers to a process aimed at avoiding or limiting the occurrence of falls amongst the elderly. It involves a whole set of measures and strategies, and can include environmental control, medical, legislative, institutional, financial, behavioural and better health awareness or control (Sachiko et al 2012). Intervention can be primary, secondary or tertiary. Primary intervention involves preventive measures taken in anticipation of possible accidental falls to curb their occurrences. Secondary intervention involves remedial and corrective actions taken to prevent former victims of

falls from falling again, as well as to cater for the injuries that they may have suffered from previous incidents. Tertiary intervention involves the psychological treatment of “fear of falling” syndrome that victims of falls often endure after their initial unfortunate experience (Debra & Rose 2010).

4.2.1 Environmental factors causing falls

Considering the icy nature of Finnish winter weather, it is obvious that many accidental falls happened outside home and on slippery roads. During the winter, careful short steps walk and its associated head down changes the body’s posture and as such, reduce the motor walking speed. European Pub Med central publish a 10 years study conducted at the University of Jyväskylä,-Finland by (Avlund et al 2004) concluded that, combination of motor speed and lower extremity strength are predictors of fall related bone fractures among the individual elderly.

According to Koski & Kivela (1998) social status, life changes, housing conditions, health, functional ability and lifestyle are all factors contributing to recurrent accidental falls among the elderly in Finland. The reduction of bone mineral density in elderly people has also been researched to be a factor associated with recurrent accidental falls among the elderly.

4.2.2 The role of medication in falls of older people

The author’s interest in this study is to bring to light the deepened knowledge about the use of medication as a major factor contributing to accidental falls and overall well-being of the elderly. Even though medication is known to increase the risk of falls among the elderly, the major risk lies in the combination of medication being taken by the elderly. One study has revealed that, combination of NSAID’s drugs, psychotropic drugs and cardiac drugs have increased risk of falling compelling to others who are not taking these medications (Granek et al. 1987). A similar research conducted by Leipezig et al. (1999) pointed out that, Benzodiazepines alone is proven to be associated with 48% of risk of falling among the elderly takers. Table 2: shows the medication, mechanisms, and their combination proven to increase the risk of fall among the elderly.

Table 2: shows medications and their mechanisms which increase the risk of falling among the elderly, (American Society of Consultant Pharmacists, Alexandria, VA)(Kathleen 2005) (modified)

MEDICATION CLASS	MEDICATION INCLUDED IN CLASS	MECHANISM WHICH AFFECTS FALLS
Benzodiazepines - Long and Short Acting	diazepam (Valium), flurazepam (Dalmane), alprazolam (Xanax), lorazepam (Ativan)	decrease in neuromuscular function, sedation, dizziness, cognitive impairment
Antipsychotics	olanzapine (Zyprexa), chlorpromazine (Thorazine), risperidone (Risperidol), haloperidol (Haldol)	blurred vision, sedation, postural hypotension, dizziness
Cardiac Medications Cardiac Glycosides Calcium Channel Blockers Nitrates	digoxin (Lanoxin) nifedipine (Procardia), verapamil (Calan), diltiazem (Cardizem), isosorbide dinitrate (Isordil), nitroglycerin (Nitrostat),	Confusion, lethargy Syncope, postural hypotension

MEDICATION CLASS	MEDICATION INCLUDED IN CLASS	MECHANISM WHICH AFFECTS FALLS
Analgesics Non-steroidal Anti-inflammatory Agents (NSAIDs)	diclofenac (Voltaren), Ibuprofen (Motril, (Advil), naproxen (Aleve), Diflunisal (Dolobid)	Cognitive dysfunction, dizziness, sedation
Opioid Analgesics	codeine and derivatives, meperidine (Demerol) propoxyphene (Darvon, Darvocet N-100)	ataxia, blurred vision, confusion, sedation
Antihistamines Gastro-intestinal-Histamine Antagonists	chlorpheniramine (Chlortrimeton), diphenhydramine (Benadryl) ranitidine (Zantac), cimetidine (tagamet), famotidine (Pepcid)	hypotension, sedation, confusion, cimetidine decreases the clearance of many drugs including diazepam, propranolol and tricyclic antidepressants, ataxia

Table 2 shows the class of medication and their mechanism of which affect falls. Mostly, four or more of these drugs combination increase the risk of fall. Amongst falls recorded in Finland, it has been observed that medication intake can play a significant role in a number of instances. Such instances includes: sedatives; polypharmacy; and cardio-

vascular medication (Pajala 2012). Sedatives are medications that induce body excitement or calm the body. There is often a tendency for users of sedatives to abuse their usage. Effect of uncontrolled medication and medical conditions can have effect on alertness, judgment, coordination, dizziness and balance mechanism (Scott et al. 2010).

Polypharmacy on the other hand denotes the use of multiple medications at any point in time by a patient. Patients with anxiety tend to abuse medical intake and this can let them vulnerable leading to accidental falls. Cardiovascular medications on the other hand denote those medicines that are used to enhance or permit better blood and lymph circulation in the human circulatory system. In Fick et al (2003), it was concluded that, the intervention research on reduction doses and withdrawal of fall risk increasing drugs successfully decreased the risk of falling.

American Medical Association published a report in Smith (1995) to outline interventions in elderly medication. It clearly stated that, elders with potentials for fall should have “Review medications that could predispose to falls; especially diuretics, cardiovascular medications, anti-hypertensive, antipsychotics, anti-anxiety agents, sleeping medications, antidepressants, reduce dosages or eliminate such medication” (Smith 1995)

A similar research conducted by Jyrkkä et al (2009) in the University of Koupio-Finland concluded that, central nervous system drugs like Psychotropic seems to be associated with increased risk of falls and suggested that common medicines use by elderly should be systematically studied for their risk factors for falls.

A research conducted by Mahoney et al (2006) introduced a sure step fall prevention program in which when followed, can reduce the risk and rate of fall. This model is called Pender Health promotional model. The promoter of the model considers every bit of individual lifestyle, mind-set, social and cultural aspects, biological factors and psychological health. Once every bit of information about a person is jot down, there is a set of actions, behavioural as well as functions recommended for individuals. More about this can be found in the Appendix 2 and application from theory to practice.

5. ELDERLY WELL-BEING

The well-being of the elderly can simply be described as judging life positively and feeling good. Many researchers of well-being find it difficult to define well-being but in general sense, any definition of well-being must have aspects of physical, social, economic, developmental, emotional, psychological, and life satisfaction.

Well-being of the elderly can be simply put as when the person's resources are in balance with his or her challenges. As (Kloep & Saunders 2009) described in the international journal of well-being, a stable well-being is when the individuals have the psychological, social and physical resources they need to meet the particular psychological, physical and social challenges they encounter. Each time an elderly meets a challenge, the system of challenges and resources comes into imbalance state forcing the individuals to adapt his or her resources to meet this particular challenges. In this case, resources and challenges must be maintained in an equilibrium state to obtain well-being and the quality of life, not necessary absence of diseases (Kloep & Saunders, 2009).

5.1 Social well-being of the elderly

The well-being of the elderly can be grouped into different categories, namely social, emotional, spiritual, and physical well-being. A research conducted by Perlman concluded that, social isolation has effect on the elderly well-being due to diminishing vitality and health (Perlman 2006). In that sense, the direct causes for being socially isolated among the elderly are the diminishing vitality and poor ill-health but the writer failed to emphasize on direct social interaction with others especially family members and friends to avoid social isolation.

Social isolation leads to loneliness as Baumeister & Leary (1995) put it. Human beings have the fundamental desire to create a positive long lasting relationship which in turn, may influence self-identity, regulation and health status. If such desired are not fulfilled, it will create deficits in belongingness and will motivate people to seek for sources to renew their inner affiliation (DeWall et al 2011)

Other researchers like Cacioppo & Patrick (2008) concluded that, loneliness affect the well-being of the elderly but in other sense, suffering from loneliness to the elderly

means that some important parts in elderly lives are missing and something must be found to replace the missing parts. It can be pet, alcohol, drugs and other things (Cacioppo & Patrick 2008).

Meanwhile, a research conducted by Dewall et al (2011) agreed to the fact that lonely people in general can have more alcohol intake, less physical activities, poor quality of sleep, less intake of healthy food, feels more stress and enjoy positive things less than less lonely people. This fulfils what Cacioppo & Patrick (2008) refers to as the replacement of missing parts in the elderly lives.

5.2 Emotional well-being

Other researchers upon analyzing the effect of emotional well-being of the elderly concluded that there is a strong link between loneliness and psychological well-being, Golden & Bruce (2009). According to Eloniemi-Sulkava et al (2009), loneliness can be separated into emotional or social isolation but Andersson (1998) on the other hand, pointed out the fact that emotional loneliness is a subjective feeling and can only be justified only when individual experience it (Andersson 1998).

Jylhä (2004) agreed with Andersson (1998) that, emotional loneliness is more or less emotional isolation or emotional loneliness. And it is more or less subjective feeling in respond to the absence of a loved one, a spouse or intimate attached figure and as such, can be only quantified by the individual experiencing it. A similar research conducted by Lim & Ee-Heok (2011) at the University of Singapore about loneliness and psychological well-being of the elderly concluded that, living alone contributes to the poor psychological well-being of the elderly.

5.3 Spiritual well-being

The importance of spiritual well-being of the elderly is mostly overlooked due to the maximum attention given to the decreasing functional capacity of the elderly. Elderly who are living in residential and nursing homes have some specific spiritual needs which are normally not recognized and as such, not addressed

Jongenelis et al (2004) dwell on their research analysis and pointed out in the journal of affective disorder about the prevalence and risk indicators of depression in elderly nursing home (Jongenelis et al 2004). They concluded that, elderly individuals may experience depression in the nursing home with the risk factors being limitations and physical affection, loneliness and lack of social support, and spiritual needs. These factors have clearly showed to influence their mood and well-being.

A research conducted in the late 80s by Shea, (1986) supported the fact that, the elderly significant needs cannot be met by only psychotherapy, social work, or other disciplines without pastoral care because, these elderly “often feels useless and without dignity.” The elderly are often found to be in the transition between dependence and independence, chronic illness and health, and above all, it is the thought of dying that mostly hunt them (Jongenelis et al 2004)

The major concern of the elderly according to Shea, are the suffering and the provident care of God, particularly in the process of crippling illness. Pastoral care specialist and councillor can help the elderly person to find their inner peace and power that can produce hope to deal with their current situation (Shea 1986). Another small pilot study conducted by Ross about “elderly patient perception of their spiritual needs and care” was published in the journal of advance nursing. It was a small pilot study that enrolled only ten patients from the elderly care assessment unit. It was found out that, the most stated needs of the elderly patients are “related to religion, meaning, love and belonging, mortality, death and dying (Ross 1997).

5.4 Physical well-being

Physical activities are beneficial for active and healthy ageing, it helps the elderly to maintain good cognitive function in old age, and in turn, increase the well-being of the elderly. A research conducted by Angevaren et al. (2010) concluded their findings to be evidence enough that, aerobic physical activities increase the cardio-respiratory fitness of eight out of eleven elderly people. The largest effect of cognitive function was found to be on motor and auditory attention. Moderate but with an increase of 14% in cognitive speed and visual attention (Angevaren et al. 2010).

Chad et al. (2005) research evidence supported the fact that, upon analysing six studies that tested 370 elderly people, found out that, exercise whether at home or at centres improved physical functions and decreased blood pressure but on the other hand, did not improve the overall well-being of the elderly.

Physical well-being of an elderly is more or less related to health but not necessary absence of diseases. Good health allows the elderly to realize their aspiration, satisfy their balance needs and to cope with their inner strength and environment in order to live long and fulfilling life. Environmental and social resources for health and well-being may include peace, economic security, safe housing, physical activities, social ties, positive emotions, healthy diet, and autonomy (Diener & Chan 2011).

6 MATERIAL AND METHOD

This work employs qualitative methodology in the examination of data. It also makes use of literature review and its content analysis. Qualitative data includes the evaluation of human behaviour especially in establishing the nexus between psychology and falls amongst the elderly. Qualitative content analysis of which deductive content analysis falls can be defined as “a research method for the subjective interpretation of content of a text data through the systematic classification process of coding and identifying themes or patterns” (Hsieh & Shannon 2005).

It is an analytical method that allows theoretical review to be used to improve the understanding of data by ways of inductive or deductive procedure. Mostly, deductive content analysis is used when the author’s aim is to retest the data in a new context. In this context, the analytical reasoning are based on these three points; existing theories, previous studies, and the experience or expected knowledge on the subject that need to be researched, (Elo & Kyngäs 2008). The process of qualitative content analysis began at the early stages of data collection. This analytic phase helped the author to move back and forth between data collection and concept development which helped the author to direct his subsequent data towards sources that are more useful for addressing his research question (Miles & Huberman 1994).

Literature review includes a critical examination of existing literature on the subject. These writings are instrumental in validating scientific claims. It is also useful as a guideline on how to practically implement the various scientific claims. The author again chose literature review for the study because it provides essential components for the study and helps the transformation of the study into clinical practice (Lau & Magarey 2006).

The author used literature review in the study by considering the following points: supporting the identification of the study topic; research questions or hypothesis; identifying the literature to which the study made a contribution to, and contextualized the study within the found literature; building an understanding of the theoretical concepts and terminology; facilitating the list of sources used; suggesting research method that was helpful; and analysing and interpreting the results found.

Based on the facts already mentioned, the author became convinced that, deductive content analysis will be more suitable for this work. First, the theoretical framework are used (ACTIVE AGEING), the aim and the research questions were inspired by previous studies, and answers to the research questions would be identified by analysing expert studies on the research topic.

The author first of all, collected the data materials, read through broad concept of accidental falls and its effect on well-being of the elderly. Then applied deductive content analysis which involves formulating the research question, collecting the data samples, analysing the data and interpreting the result by coding scheme or categorizing text from the article reviewed, (White & Marsh 2006, Elo & Kyngäs 2008 p.112). The author then used the research aim and theme for formulating the research question (White & Marsh 2006). Deductive content analysis demands the researcher from the beginning of the process, to analyse the articles from their manifest and/ or latent content. According to White & Marsh, (2006, p 23), “a manifest content implies easily identifiable aspect of the text content, and latent content refers to a hidden issues not expressed in

writing but can be reasonably inferred”. The author considering the aim of this study decided to use both manifest and latent content to analyse the articles.

6.1 Data collection

Literature review was done with all the selected articles and journals found out about the authors’ topic. According to Rowley & Slack (2004), a literature review is used to draw on and evaluate a range of professional journals, articles, books and web-based resources and it is also a summary of a subject field that supports the identification of specific research questions. Search engines are therefore used to search web resources and bibliographical databases.

The author at the beginning of the selecting process used many search terms relating to the topic. The author later narrowed down the search terms to the following: consequences of falls, an elderly, and prevention of falls, falls, elderly well-being, and quality of life. These search terms were chosen as the final search terms for the selection of the data material because they were related to the topic and they content provided answers to the research questions.

The author used the following search engines and journals for the study: EBSCO, GOOGLE SCHOLAR, GOOGLE BOOKS, and CINAHL. The author then started by joining the words like consequences of fall “and” among the elderly, falls and its prevention. Age group targeted was 65+. During search in EBSCO database, using older people instead of elderly gave thousands of results. Since the initial hit with the search results were high, the author made an inclusion and exclusion criteria to limit the search results.

6.1.1 Inclusion and exclusion criteria

Inclusion criteria was used for this study by the author since this method helps to state out clearly the information and researches that corresponds directly to the subject area, and also to be more specific and concise. The author’s priority was selecting articles

which are directly related to the topic from 2000-2012 in both English and Finnish, reviewed articles with abstract, free articles, and easy to understand research article.

The author also noticed that, results from topics searched are in very large quantity so it was appropriate to apply exclusion criteria to retrieve topics and articles related and relevant to the topic. The exclusion criteria were paid articles, articles without concrete result that suggests continuation, in other languages than English and Finnish, and too old articles. After these criteria's were applied, ten (10) articles were finally selected. The table 3; data retrieved.

Table 3: The results of the search database, the key words used for the search, and the number of articles selected.

Database	Search words	Found literature	Chosen articles
EBSCO host	Preventive measures AND accidental falls AND elderly	5,051	2
EBSCO host	Risk factors AND falls AND elderly AND prevention	33,194	2
EBSCO host	Quality of life AND older people AND accidental falls	6,302	1
EBSCO host	Older people AND psychological impact AND accidental falls AND institutional care	5,235	3
EBSCO host	Death AND elderly AND Finland	90	2
EBSCO host	Consequences of falls AND older people AND institutional care	10,077	3
EBSCO host	Risk factors AND falls AND elderly well-being	3,901	2
EBSCO host	Elderly falls AND preventive measures	12	2
			Total= 17

6.1.2 Description of Articles

Final ten articles selected have an international background because there were conducted in Australia, Finland, Sweden, and America. Most of the respondent in the studies were elderly 65+. The table 4: represents a summary description of ten (10) articles used as data materials for this thesis. The description will include the authors' name(s), year of publication aim of the study and the results.

Table 4: The ten Articles selected for the results.

Authors and year	Topic	Reason for research	Research design	Result/Conclusion
Halvarsson et al. 2011	Effects of new, individually adjusted, progressive balance group training for elderly people with fear of falling and tend to fall: a randomized controlled trial	Evaluate the effects of a new, individually adjusted progressive and specific balance group training programmed on fear of falling, step execution, and gait in healthy elderly people	Randomize controlled trial	Balance training program is feasible and lead to decrease in fear of falling, decrease time in step execution and increase velocity during walking.
Mau-Roung et al. 2007	'A Randomized, Controlled Trial of Fall Prevention Programs and Quality of Life in Older Fallers'	Compare the effects of three fall prevention method: home safety assessment and modification, exercise training and education	Four months randomized trial	Exercise training had a greater improvement in functional reach
Hart-Hughes et al. 2004	An Interdisciplinary approach to reducing fall risk and falls	Discuss functional profile of veterans at high risk of falls, their fall rates and fall prevention treatment plan	Two years Clinical project	Three fold reduction in falls following the initial fall clinic visit when compared to pre-clinic values.

Authors and year	Topic	Reason for research	Research design	Result/Conclusion
Mitchell 2006	'Evaluation of an integrated falls education group program'	Describe how a working group develop an education programmed for older patients using local hospital and community services and explain how programmed was evaluated	Quantitative research	Overall participants improvement in some areas after interventions
Karlsson et al. 2013	Prevention of falls in elderly - a review	identify fall-preventive strategies proven effective in the aspect of fall reduction or reduction in the number of fallers in community-living elderly and in elderly living in hospital settings and nursing homes	Randomized controlled trials	Most effective approach to reduce both the risk and rate of falls in elderly community-dwelling individuals is multicomponent exercise programs targeting strength, balance, flexibility, or endurance. Programs that contain two or more of these components reduce the risk of falling as well as the rate of falls.
Boyé et al. 2012	The impact of falls in the elderly	Overview of the impact of falls in the life's of elderly people	Literature review	Falls has a substantial impact with consequences such in the life of elderly people.
Iglesias & Torgerson 2009	The health – related quality of life and the cost of implication of falls in elderly women	Investigate the impact on health-related quality of life (HRQoL) associated with falls, fractures and fear of falling and falls and fractures cost.	Longitudinal study	Results suggest that the main burden to morbidity, measured as impact on health-related quality of life , is due to fear of falling rather than falls or their consequences, such as fractures. impact on HRQoL of a fracture was at least twice as large as that associated with falls

Authors and year	Topic	Reason for research	Research design	Result/Conclusion
Forsén et al. 2003	Prevention of hip fracture by external hip protectors: an intervention in 17 nursing homes in two municipalities in Norway	To study the estimated effects of hip protectors on the incidence of hip fractures resulting from fall experience by nursing home residents	Pre-test/test design	Showed considerable reduction in hip fracture incidence.
van Schoor et al. 2003	Prevention of Hip Fractures by External Hip Protectors A Randomized Controlled Trial	Examine the effectiveness of hip protectors in reducing the incidence of hip fractures in an elderly high-risk population.	Randomized controlled trial	The hip protector studied was not effective in preventing hip fractures
Banez et al. 2008	Development, Implementation, and Evaluation of an Inter-professional Falls Prevention Program for Older Adults	Describes the development and implementation of an Inter-professional Falls Prevention Program (IFPP) designed for community-dwelling seniors	Pilot study	Inter-professional falls prevention program achieved its aims of enhancing the health and well-being of people who experienced a fall,

6.2 Content analysis

Deductive content analysis was suitable for this study simply because, as Joubish (2002) put it, deductive content analysis is a scholarly method suitable to study humanities and authenticities by which the texts are studied. According to Hsieh & Shannon (2005), deductive content analysis are generally based on earlier literature reviews, theories and models, therefore have already developed categorized matrix that can be used to subdivide subsections of main category to other smaller subsections (Polit & Beck 2004).

The author after analysing many contents, decided to choose to use the method preferred by Elo & Kyngäs (2008, p.112). Using content analysis meant a systematic grouping of the ten articles selected into main category, generic category and sub-category. Before starting the data analysis, the author grouped the ten articles from 1-10, read through several times and highlighted the important points considering the aim of the study and based on that, formulate the research questions. Data analysis demands interpretation of the results by stating the theme, and then divides them into main categories, generic categories, and sub-categories to describe the results, (Elo & Kyngäs 2008 p.112).

6.3 Reliability and validity

According to Elo & Kyngäs (2007) the reliability of the study is evaluated by how the link between the results and the data was demonstrated. This exact process the author had followed creating reliability of his work, by defining and describing his findings from informational data as expected. Credibility on the other hand deals with how well the categories cover the data. The results category 1 & 2 clearly covers the research questions and the author had followed the valid procedure to arrive at the same results.

6.4 Ethical consideration

The author read and understood the Helsinki declaration regarding ethics (Declaration of Helsinki 2004). The Arcada Thesis Guide, Herten et al (2009) was also read with the aim of avoiding rewriting, plagiarism and with the intention of doing well academically

written thesis. In this writings, the reference materials such as books and research articles are quoted and cited properly and all listed specifically corresponding references are according to Arcada thesis guide.

According to Elo & Kyngäs (2008), authentic citation can be used to increase the validity of a research and also help readers to identify what kind of original data categories formulated and this was also applied in the study. The author will testify to it that no addition has been made to any research used or anything changes but everything was done scientifically to authenticate the validity of the research process.

7 RESULTS

The purpose of this study is to raise awareness about the consequences and the alarming rate of falls amongst the elderly on the one hand, and to revisit effective prevention strategies that can most likely produce positive outcome. Both of these issues have been proven with the aid of general information, facts, statistics, (theoretical and graphical). The results of this research findings is presented in two categories resulting from the first and second research question. Effects of accidental fall on Well-being (Question 1) and effective intervention strategies for preventing falls among the elderly (Question 2).

7.1 How do accidental falls affect the well-being of the elderly people?

To answer the research questions, the author elaborate in a tabulated form the effect of accidental falls on well-being of the elderly, its social and economic consequence and as well as its effects on physical and psychological well-being.

Table 5: Showing results of first question in reference to the effect of well-being of the elderly people

Main Category	Generic category	Sub- category
Effects of accidental falls on well-being of older people	Effects on Social and Economic Well-being	<ul style="list-style-type: none"> ✓ Hospitalization, Medication cost, surgery ✓ Specialist visit and Caregivers visit ✓ Home help and residential accommodation services ✓ Decrease in social activities and general quality of life ✓ Increase dependency
	Effects on Physical and Psychological Well-being	<ul style="list-style-type: none"> ✓ Fear of falling – risk of falling ✓ Traumatic brain injury, hip fractures, upper extremities fractures, pressure related injury, skin tissue damage, and infections ✓ Death ✓ Loss of mobility ✓ Decrease in activities ✓ Increase in symptoms of depression

As seen on table 5, the main category shows the effect of falls on the well-being of the elderly, generic category shows how the effects under-minds the well-being, and the sub- category shows the consequences of which falls affect well-being.

As earlier mentioned, accidental falls are the leading cause of death and functional disability among the elderly 65+ and it is also noted that, the risk of falling increases with age. Approximately one out of three people aged 65+ experience falls every year (Boye

et al. 2012). The negative impact of accidental falls was the main issues that the articles revealed during the analysis. In Mitchell (2006) it was stated that accidental falls has several consequences and it is the leading cause of mortality in people over 75+. Accidental falls affects social, physical, economic, and psychological well-being of the elderly person experiencing the fall.

The author considered these different aspects or areas of well-being affected by fall to represent the categories. Thus, social and economic well-being were grouped on one hand and physical and psychological well-being on the other hand.

7.1.1 Effects of fall on Social and Economic Well-being

On the domain of economic well-being, the effect of fall has a negative impact on the financial situation of the elderly. The articles revealed that, falls lead to hospitalisation and incurred cost of medication to the elderly or family or social welfare system. Iglesias *et al.* (2008) stated that fall may lead to surgery, specialist contact visits, home help, nurse visits, or may result to moving into a residential accommodation.

The effect of fall on the social well-being of the elderly experiencing the fall was visible in the decrease in social activity level and general decrease in the quality of life. Fall has the negative effect on the life of the elderly person because it may result to increase dependency resulting from disability sustained during the fall. (Hart-Hughes *et al.* 2004, Mitchell 2006).

7.1.2 Effects of fall on Physical and Psychological Well-being

On the physical domain, Boyce et al. (2012) and Iglesias *et al.* (2008) both indicated that fracture is the main diagnose after fall and that it has twice as much negative impact on the well-being of elderly people. It was stated in one study that studies in Finland, Netherlands and USA, revealed that about 60.7 of people ages 65+ who experience falls have traumatic brain injury as a result of their fall. Fall results to hip fractures, wrist fractures, and vertebral fractures and in some severe cases, in death.

Problem associated with falls include loss of mobility, psychological difficulties such as fear of falling, pressure related injury, soft tissue damage and infection (Boye et al.

2012, Iglesias *et al.* 2008). The fear of falling is one of the most negative effects of fall on older people who have experienced it. It was stated in one article that 21% to 85% of older people are afraid of falling. Self-reported fear of falling hinders mobility and also results in avoidance of activities that entails reaching out.

Accidental fall is associated with decreased quality of life and increase symptoms of depression. This aspect is very crucial because it is not only a consequence but a risk factor for fall (Iglesias *et al.* 2008, Harlvarsson *et al.* 2011). However, it was stated in Harlvarsson *et al.* (2011) that previous fall does not necessarily stimulate the fear of fall and social activities or personal care are not necessarily affected by it.

7.2 What are the effective intervention strategies for preventing falls among the elderly?

The summary to give the readers a glance in a tabulated form the answer to the research question 2, the effective preventive and intervention measures to prevent falls.

Table 6: Summary of the result category two: Effective intervention for preventing falls

Main category	Generic Category	Sub-category
Effective intervention to prevent accidental falls	Physical exercise	Multi-component training: muscle strengthening and balance training, Flexibility and endurance training Tai chi, walking Most effective intervention for reducing risk and rate of falls
	Education	Coping and tips for prevention, social support. Step construction
	Home assessment	Assessment of risk, identification of hazard , assessment of safety, recommendation of home modification,

	Generic Category	Sub-category
	Medication	Gradual withdrawal, reviewing, optimization and prescription of psychotropic medications reduces rate of fall
	Nutrition	Vitamin D supplement Complex relation with preventing accidental falls
	Foot wear	Anti-slip devices
	Hip protector	Reduces injury resulting from fall specifically hip fractures
	Specialist and surgical	Surgery for cardiac pacemakers, cataracts

The prevention of fall is not an easy task for the reason that fall has so many risk factors (Boyer et al. 2012). Many prevention measures were proposed by the literature to reduce the rate of fall and also risk of fall. Interventions may be done in a group or individually (Banez et al. 2008). The articles analysed revealed that multifaceted interventions especially those that were individualised have the highest effect of reducing the rate of falls as well as the risk of fall for older people (Karlsson et al. 2013). Also literature revealed that interventions like hip protection are for the purpose of reducing the injury from fall and not the risk or rate of fall (van Schoor et al. 2003).

In Banez et al. (2008), it was stated that for interventions to be successful in reducing the rate of falls the intervention plan should be inter-professional. Inter-professional team in this study developed a more comprehensive assessment program which produced a more effective result in reducing the risk and rate of fall amongst high risk fallers. Inter-professional team consist of nurses, social workers, physical, physiological, cognitive behavioural experts, social workers, occupational therapist, dieticians amongst others (Banez et al. 2003).

Multifaceted interventions include: exercise training, medication review, education schemes on falls, vision assessment referrals and surgery, home hazard assessments and interventions, nutritional supplements, footwear and hip protection intervention, and specialist check-up and Surgery (Karlsson et al. 2013, Mitchell 2006, Boye et al. 2012, Iglesias et al. 2008, Halvarsson et al. 2012, Mau-Roung et al. 2007, Hart-Hughes et al. 2004, van Schoor et al. 2003, Banez et al. 2003). In Boye et al. (2012), it was stated that identifying the population that will benefit most from a particular multi-factorial intervention programme is very important. It is essential that the individual situation of the person for whom the intervention is planned should be considered and the determination components of the multi-factorial intervention should be well chosen according to the needs for the interventions to be most effective (Boye et al. 2012).

7.2.1 Physical Exercise Training

Training exercise has been proven through the data material as the most effective intervention for reducing the risk of falls and the rate of falls with the elderly population (Karlsson et al. 2013). Compliance in physical training reduced the rate of falls in nursing home residents (Karlsson et al. 2013). It was indicated that for exercise training to be effective it must include many modules or should be multi-component programs. This includes muscles strengthening exercises and balance training on one hand and on the other hand flexibility and endurance training all of which should be done in increasing levels of intensity or difficulties (Mau-Roung et al. 2007, Karlsson et al. 2013, Banez et al. 2003).

In Mau-Roung et al. (2007) exercise training increased stability of trunk muscles, hip extensors, knee flexors, and leg muscles strength. Balance training included exercise such as: rising from the sitting position to standing position and back, walking backwards and sideways, and standing on one leg. Stretching the neck, hips, knees, ankles and shoulders were also exercises training under this intervention (Mau-Roung et al. 2007).

Finding from Karlsson et al. (2013) indicated group multicomponent training reduced rate of falls by 22% and risk of falls by 17%. For individual multicomponent training reduced rate of falls by 34% and risk of falls by 23%. Most articles confirmed the fact that 'Tai chi' reduces the number of falls. One study in Karlsson et al. (2013) revealed that Tai chi is a good intervention method for the prevention of falls as the training results showed that rate of falls were reduced by 37% and risk of fall by 35% after the intervention.

Walking was noted as a method of exercise which aims at improving performance. However, it does not prevent fall because of the fact that most falls occur during walking. Two studies in Karlsson et al. 2013 indicated that walking alone did not reduce the number of falls or risk of falls.

7.2.2 Education

Results also indicated rising awareness about the risk factors of falls and prevention of falls to elderly and their families is a good intervention which produces lasting results in the prevention of accidental falls amongst elderly people. In Mitchell (2006), it was stated that education intervention for the prevention of falls was to promote environmental safety of own home, educate and give advice about coping strategies, healthy lifestyles, fitness and general well-being.

The education topic covered during such education training included topics relating to the use of mobility aid; eat and drink for health and the safe use of mobility assistive devices. Education interventions also include training on tips on footwear, how to execute steps rightly to avoid falling. In Harvarsson et al. (2011) it was stated that the ability to execute rapid steps decreases with age and that this skill is very important in preventing falls. This is because a delay in step execution may cause a fall. Education sessions in Mitchell (2006) included 'mop-up session'. These sessions included training in stepping on banana skins, stampede board games and post outcome measure. Education also includes training in podiatry, vision, hearing, and medication (Mau-Roung et al. 2007, Mitchell 2006, Banez et al. 2003). Education was an effective means of intervention for the prevention of fall as indicated in Mitchell (2006) because the participants

were persistent and the social benefits of getting together in a group was very cherished by the elderly.

7.2.3 Home assessment

In Mau-Roung et al. (2007), it was stated that to prevent falls, home assessment should be done on the living environment of the elderly to determine the presence of environmental hazards as well as the assessment of the absence of safety devices must be considered. In this study the intervention regarding home assessments that was successful in reducing falls enlisted specific recommendation for home modification and identify the various hazards (Hart-Hughes et al. 2004, Banez et al. 2003). Appendix (1) shows and example of home assessment checklist as revealed by one of the articles.

The finding revealed that the risk of fall reduced from high to medium after home assessment intervention was carried out (Mitchell 2006, Karlsson et al. 2013). It was stated in Karlsson et al. (2013) that home adjustment did not reduced the risk of fall in low risk people as much as it did on high risk individuals.

7.2.4 Specialist check-up and Surgery

It was stated in the articles that vision problems are a big risk to accidental falls. It was stated in Karlsson et al. (2013) that the rate of falls was reduced by 58%, when surgery such as Cardiac pacemakers were inserted in people with cardio inhibitory carotid sinus hypersensitivity. Also eye cataract surgery reduced rate of falls by 34% in one of the studies in Karlsson et al. (2013). However it was stated for eye surgeries done on the second cataract eyes, no reduction was seen in the level of falls.

It was agreed in most of the articles that knowing the older person for whom an intervention plan is made is the first step toward achieving good results. Keeping a history of the falls is a very important intervention to examine the risk factors of falls. Regular specialist check-up or physiological check-ups like vital signs, visual screening, motors

sensory, reflexes and cerebella signs, depth perception, pain assessment, are important things that can proactively reduce risk of falls. In addition, assessment of range of motion, functional strength, grip testing, and gait analysis are important in fall prevention. (Hart-Hughes et al 2004, Banez et al. 2003).

7.2.5 Medication related interventions

Adjustment or gradual withdrawals of psychotropic medication in older people have been revealed to reduce the rate of falls amongst older people living in nursing homes. One study in Karlsson et al. (2013) indicated up to a 66% reduction of falls when psychotropic medication were gradually withdrawn, 39% reduction in fall when medication was reviewed and optimized, and 38% when medication was prescribe by a pharmacist. This is a very effective method for prevention of accidental falls amongst elderly (Banez et al. 2003).

A similar effective intervention method was recommended by American Medical Directors Association to reduce falls among the elderly. The guideline clearly stated that, elders with potentials for fall should have “Review medications that could predispose to falls; especially diuretics, cardiovascular medications, anti-hypertensive, antipsychotics, anti-anxiety agents, sleeping medications, antidepressants, reduce dosages or eliminate such medication” (Society et al 2001). For the elderly who are already victims of accidental falls, “Review for presence of medication that could predispose to falls; adjust dosage or stop medication as indicated, review for recent changes in medication regimen” (Society et al 2001). Application of such guidelines reduced falls by 38%

7.2.6 Nutrition related interventions

In Iglesias et al. (2008), it was stated that calcium and cholecaliferol (vitamin D3 was helpful in the prevention of fractures in primary care. Karlsson et al. (2013) indicated that vitamin D3 supplement interventions help in vision problems specifically in the first stages of Cataract surgery and pacemakers implantation in patients. Vitamin D supplement in randomized trail studies indicated that the number of falls was reduced

by 28%. It was also revealed that the rate at which this intervention was successful depended on the level of vitamin D of the (Karlsson et al. 2013). The results in Banez et al. (2003) showed that fall rates reduce by 43% when intervention was done on people who had a deficiency in vitamin D but no significant changes were noticed with people who had normal vitamin D rates.

Also the studies revealed that different types of vitamin D supplements have different results thus making the effectiveness of this intervention complex to comprehend. It was revealed that vitamin D supplements like alfacalcidol was not associated with reduce falls frequently. But Calcitriol supplements reduce falls by 36% (Karlsson et al. 2013).

7.2.7 Footwear and Hip protection intervention

Wearing anti slip shoes devices when walking in icy weather conditions has been proven to reduce the rate of falls and that the injury during fall may not result to hospitalization when anti slip shoes are in use. Interventions reducing the fear of falls may increase health-related quality of life.

This intervention is not aimed at reducing the rate or risk of fall but preventing the injury from falls, with hip fracture being the most common. In Forsen et al. (2003), it was indicated that it is a very common intervention used by nursing homes and the hip protectors are provided free of care. High risk clients benefit more from this intervention. It was indicated that the number of falls witnessed in Forsen et al. (2003) reduced from 98 to 60 making a 39% reduction of hip fractures. Night and day use of hip protection had a more beneficial effect.

Application of theory to practice

The author throughout this thesis project has learnt a lot of new intervention strategies that when applied in elderly homes can improve the well-being of fall victims. This involves the awareness of those elderly with gait and balance control problem. Such problems are a predictor of future falls and can be seen visually, hence, awareness about that will encourage action plan to prevent fall before the occurrence. Increase intake of vitamin D would be promoted among the elderly about its therapeutic effect.

Elderly homes guidelines are pretty static and rarely undergo any reformation. As a result, elderly homes execute the same practice over and over again, and as a result producing the same results. Given that accidental falls constitute an alarming percentage for all yearly accidents, it is high time that the policy frameworks governing these institutions are reformed. Interventions for the prevention of falls should be back by legal reforms and they should be practice according to standard protocols set by the policy makers. Besides policy, there should be a good collaboration between national organizations and state coalitions to work together to reduce falls related injuries among the elderly in order to optimize their well-being.

In order to implement the results of this work effectively, it would be necessary to implement evidence based policies and procedures which are culturally appropriate and require multi-sectarian collaboration, commitment from professional educational system and evidence based intervention from traditional and alternative sources (Gillespie et al 2003). Prevention programs should be self-therapy treatment and should co-ordinates medical intake, environmental assessment, risky behaviours and personal exercise. The intervention makers should ensure firm adherence.

An example of a very effective intervention program is the Pender's Health Promotion Model created in 2006. Institutions, especially in the USA that have tested it have been able to motivate individuals to engage in behaviours directed toward the enhancement of health. The pander health promotional model considers steps by which a person can improve their health, quality of life and a total well-being. To achieve that, the model takes into consideration a person's characteristics and experiences, behaviour specific cognitions and affect, and behaviour outcome of individual persons to determine the best possible method to use to attain improved health, enhance better quality of life, and

functional ability. This model is a sure approach to attain good health and balance life for the elderly (Mahoney et al. 2006). Appendix (2) shows the Pender model

A simple assessment questioner might help to identify the real factor associated with individual fall victims. If it was the cause of behaviour, more emphasize will be place on that issue to recommend a set of actions to counter-balance such behaviour to obtain well-being. Fall related assessment questioner may includes questions such as:

“Who lives in your household?, Why did you think you fell? Where did it happen? When did it happen? What were you doing when you fell? What were your injuries? Who did you tell about your fall? What activity have you stopped doing due to fear of fall?” (*Pender’s Health Promotion Mode 2006*).

8 DISCUSSION

As earlier mentioned, the aim of this study is to create awareness about the consequences of falls among the elderly in other to suggest preventive measures that can improve the well-being of the elderly. The author strongly believes that, many risk factors causing falls can be prevented and as such, with effective intervention approach, many falls can be avoided.

The author’s use of qualitative methodology in examining the data and deductive content analysis was useful for this study since it allows practical implementation of various scientific claims. The author’s critical literature review and analysis came into conclusion that, the best theoretical framework to be used for the study should be (WHO 2002) “Active ageing” as it lays down foundations to promote well-being of the elderly, even though other researchers suggested “Healthy Ageing” should have been more encouraging.

This framework, together with earlier studies on the topic was direct and useful that helped the author to come to reasonable conclusion in his results. Active ageing theoretical framework seeks to promote well-being of the elderly through the process increasing the opportunity for health, social and economic participation, and security for the elderly. In the health wise, decreasing the impacts of accidental falls among the elderly

people is one agenda of Active Ageing policy framework. The results of the research finding for question 1 indicated that, the impact of accidental falls affect the well-being of the elderly negatively just as the Active Ageing framework seeks to create awareness. The results of the second question suggest preventive measures to delimit the occurrence of accidental falls in other to promote well-being of the elderly.

Author's research findings that, the use of medication of more than four medicines and the type of combinational medicines are major risk factor for elderly fall. These findings were strongly enough to call for interference from American medical directors association (AMDA) to come up with guidelines to prevent falls among the elderly.

Recommended intervention by the association (AMDA) Smith (1995) clearly stated that, elders with potentials for fall should have "Review medications that could predispose to falls; especially diuretics, cardiovascular medications, anti-hypertensive, anti-psychotics, anti-anxiety agents, sleeping medications, antidepressants, reduce dosages or eliminate such medication" (Smith 1995). For the elderly who are already victims of accidental falls, "Review for presence of medication that could predispose to falls; adjust dosage or stop medication as indicated, review for recent changes in medication regimen" (Smith 1995). The British Geriatrics Society also joined the medication intervention strategies to prevent falls among the elderly by initiating measures. This was evident in the statement that:

"Patients who have fallen should have their medications reviewed and altered or stopped as appropriate in light of risk for future falls. Particular attention to medication reduction should be given to older persons taking four or more medications and to those taking psychotropic medications" (Geriatr soc, 2001).

Gender differences are a risk factor for falling in older age. Being an elderly woman and over the age of 75 years makes one vulnerable to reoccurring accidental falls with a major consequence being a hip fracture. There are different findings proving that elderly women falls most often but the fatality rates due to falls are more prevalence in older men than older women (Dolinis et al.1997). There have been many reasons for this but very difficult to prove by researchers. Different disciplines have proved the fact that, it's not just gender differences but also racial difference affect falls. It has been well documented that being a white elderly male and over the age of 80 years have the high-

est rate of fatal falls, followed by their black counterpart male (Stevens & Dellinger 2002).

Most of the researches indicated that the interventions were not 100% suitable to the prevention of fall and could not be generalized. For example they constantly indicated that an intervention may be beneficial to a specific group of elderly people and not others. This point is also viewable in the fact that most of the intervention were said to reduce the rate of fall and not the risk of falls and vice versa.

The author is strongly convinced that, the awareness of these findings, coupled with the results of this study if channeled into policy and educational reform can produce an effective outcome in the quest for preventing accidental falls. All professionals in every care settings need awareness of all kinds of risk factors and the need to identify the elderly who are most at risk of falling. Awareness about the changes in their physical function, balance difficulties, changes in their cognitive function, dizziness, sedation and confusion are all signs to refer an elderly to health professional for an in-depth assessment.

Education can be very important component in most successful strategies in preventing falls. There should be a need to change the elderly citizen perspective that they may no longer see falls as “accident” that cannot be avoided but instead, a predictable event that can be prevented with some specific preventive actions. Educational program for nursing staff, practical nurses, home support workers and family care givers may increase their awareness and concern about the risk of falls. Thus, this may increase their readiness to implement some strategies to prevent falls.

A critical analysis of this study revealed that, answers to my research questions are answered. Based on the data analysis, the research finding reveals that, accidental falls affect the elderly negatively, and as such, hinders the well-being of the older people. There are also numerous preventive measures suggested based on the research findings that if followed can reduce the rate of falls among the elderly.

9 CONCLUSION

There are many risk factors to accidental falls and the consequences on the well-being of older shows that proactive fall prevention is very essential in elderly care. It is imperially proven that accidental falls of an elderly person may affect their socially, physical, psychological and economic well-being of the elderly who has experience a fall. For intervention programs to be successful, they should achieve the aim by enhancing the health and well-being of people who experience fall as stated by the theoretical framework. Accidental falls are a major health challenges among the elderly 65+. Injuries resulting from falls are rapidly increasing despite numerous researches about the problem. Falls can lead to hip fracture, hospitalization, functional limitation and disability, and significantly decrease the quality of life and well-being of the elderly people (Salkeld et al 2000). Rate of falls increase with age and as such, elderly people are more susceptible to unpredictable falls than younger people.

For the prevention of fall to be effective the intervention to prevent the fall must be individualized and must be multifactorial. It is only when the individual's personal status is taken into consideration that effective treatments can be realised to the maximum. The individualization nature of interventions programmes is very important as it help to determine the particular needs of the elderly, degree of needs and suitable intervention measure to maximise the outcome of the intervention. Also throughout the article, it was emphasized that the intervention programme should have different modules that are multifactorial. Interventions which are more multifactorial produced the most beneficial results.

Another point which is important is the fact stated by Banez et al. (2008), which indicated that the most effective interventions to reduce the risk of fall for high risk fallers should be done by an inter-professional team. Hip protection as a means of intervention was important even though the results showed contrary views on its effectiveness. Hip protection is the most regular means of intervention related to falls used in many nursing homes in Finland.

Three main interventions were the home assessments; education; and physical exercise interventions. Most of the articles revealed that physical exercise was the most effective in reducing the risk of fall as well as the rate of falls. Notwithstanding these benefits vigorous increase the possibility of risk of fall or injury. History of the client is a very important fact. Nursing homes should record in details when falls occur, this is best way to access risk of falls. In Finland, EFFICA client database has a form for recording all falls that occurs in the homes. This information is directly mailed to the head nurse and doctors and also available on the client's history. This is a very good system that can effectively record the client's fall history which can be very instrumental to drafting of an effective intervention plan. Identification of falls and the places where it occurred may contribute to its prevention.

Active ageing according to world health organization, is the process of increasing opportunity for health, participation and security in order to optimize the well-being of ageing people. The importance of lifestyle factors, healthy aging through combination of training, advocacy and research were the main goal for WHO (2002) in promoting active ageing. Elderly who are more involved in active physical activities and exercise as they age retain good postural balance even in their old age compared to their counterparts with less physical activities. It has been noted that irrespective of whether an injury occurs from a fall or not, most victim of a fall is bound to start experiencing a downward spiral, that is, the fear of falling syndrome, thus further alienating the individual from independent activity for fear of falling again.

In the final conclusion, showing the connection between the previous studies, theoretical framework and the results of this work is very important. The previous studies indicated that there are many risk factors that promote the occurrence of accidental falls, (Granek et al. 1987). The theoretical framework is on Active Ageing which is based on improving the well-being (Social, Physical, Psychological and Economic) well-being of older people, (WHO 2002). The results indicated that accidental fall turns to diminish these dimensions of well-being and that effective preventive intervention measures can reduce or prevent accidental falls as well as enhance health and well-being of elderly which is the main goal of the active ageing policy.

Critical analysis of results

The author used literature review for the study. The language used was English even though Finnish articles and books were also used. The author felt that, direct data from the elderly themselves and their care workers could have given more insight to the research but the method used did not allow that. The results category 1 & 2 clearly covers the research questions and the author had followed the valid procedure to arrive at the same results.

The author became aware that, even though there are many researches on the topic, many of the researched findings were not implemented simply because the researchers themselves did not involve the elderly and have little to do with elderly people. Another important point the author notice was that, even though multifactorial interventions proved to be effective, it was less effective with the elderly with dementia and cognitive impairment. This is because most multi-factorial intervention studies have been conducted in community settings and in most cases, similar approaches in residential care homes are not successful because of cognitive impairment among residential care facilities. Few studies have targeted or assessed fall prevention in men and the relationship between ethnicity and intervention in ethnic groups.

10 RECOMMENDATION

The author suggests rehabilitation which adherence may reduce the risk and impact of fall to the venerable segment of the elderly population. Elderly who have had a history of falling in the institutional home settings should be advised to wear hip protectors since hip fractures seems to be the most common injuries resulting from accidental falls. Minor risk assessment should be done by the institutional care providers to avoid minor risks of falling. Minor risks assessment may include the type of indoor shoes the elderly are wearing, distribution of carpets on the floor, furniture arrangements, and the type of lighting system they use during the sleeping time.

Rehabilitation can be of greater help to the victim of accidental falls. Many victims of falls become afraid of falling again and as such, develop solitude behaviours preventing them from undertaking any physical and social activities. Any effective rehabilitation design for accidental falls elderly should involve balance training and social participation.

Falls amongst the elderly are not to be regarded as part of ageing process but rather other factors that caused the fall in the first place should be considered. A single fall can be a combination of multiple factors, in that sense, identifying these factors may improve the effectiveness of preventive measures.

There should be a need to change the elderly citizen perspective that they may no longer see falls as “accident” that cannot be avoided but instead, a predictable event that can be prevented with some specific preventive action. The awareness about male gender inequality in fatal falls among the elderly should be created. Such awareness will drastically reduce behavioural determinants leading to falls.

There should be a system in place to monitor changes of medication for any elderly taking four or more medications who have had a history of falling, especially those taking a combination of NSAID's drugs, psychotropic drugs and cardiac drugs. Benzodiazepines alone are proven to be associated with 48% of risk of falling among the elderly takers so extra attention should be directed to any elderly taking such drug. Is the risk of taking such drug greater than its therapeutic effect? Then it should be replaced.

The author recommends further research about medication involvement, gender and race, traditions and cultural influence in preventing falls among the elderly. Some findings mentioned about the rate race affect falls, being a white male and over the age of eighty (80), have the highest rate of fatal falls, followed by black men, then white women and least of all, the black women. More findings about this will improve future preventive measures.

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Appendixes

Appendix 1:

Home assessment intervention (Mau-Roung et al. 2007)

Room or area	Hazard
overall	Poor lighting (too dim or with shadows or glare), Slippery floor surface, Walkway with cords or other small objects one could trip over, Curled carpet edge
Stairs	Hard-to-see step edge, No night light, No or inadequate handrail Stairs too steep, tread too narrow Steps in need of repair, High door sill
Living room/ bed room	Low chair that is difficult to get out of ,Unstable chair or table, Unstable step stool, Shelves or cupboards too high or too low, Low or high bed height
Bathroom/Kitchen	Loose rug, Lack of grab rail Toilet seat too low, No slip-resistant surface, Poorly placed light switches Light switches not visible in the dark, Hob on shower recess
Yard and entrance	Slippery, obstructed, or uneven pathway, ramp, or stairway Cracks in pavement, holes in lawn Rocks, tools, and other tripping hazards

Appendix 2:

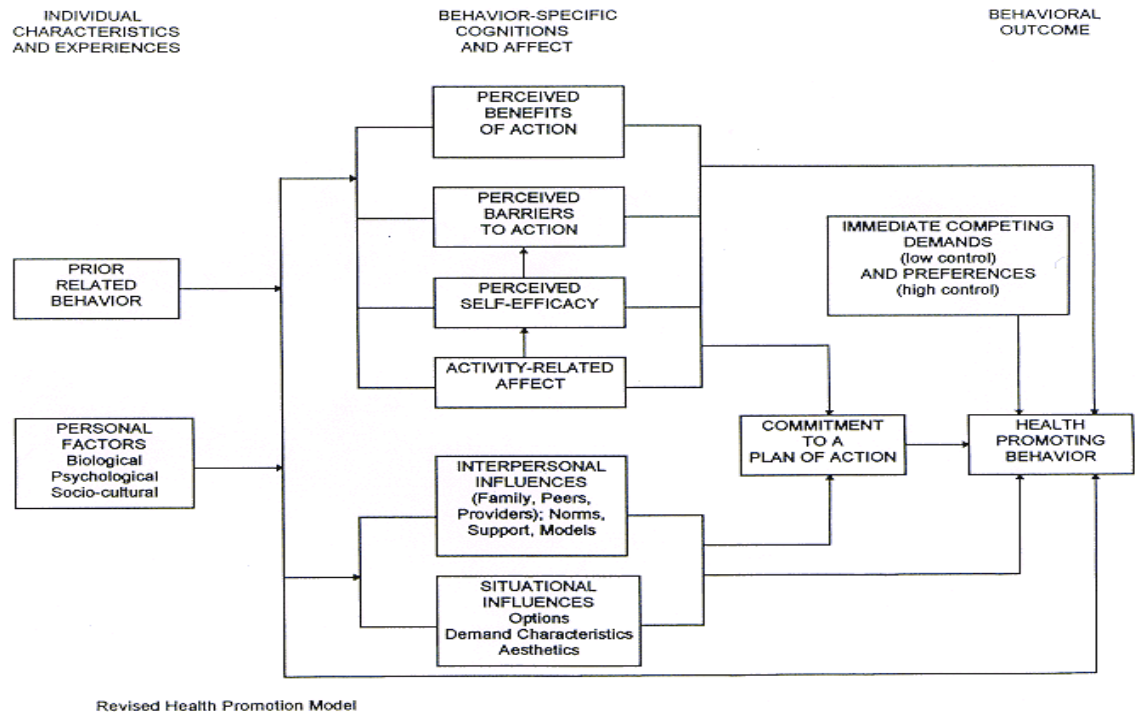


Figure 5: An example of an in-home Sure step Prevention Program: Pender's Health Promotion Model (2006). (Mahoney 2006)

ABBREVIATIONS

ABBREVIATIONS	FULL NAME
WHO	World Health Organization
EUNESE	European network for safety among elderly
PROFANE	Prevention of falls network europe
AMDA	American medical directors association
HRQoL	Health related quality of life
NSAID	Non-steroidal anti-inflammatory drugs