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## Fall Risk Beliefs and Behaviours following a 'Good Fall': A Mixed Methods Study

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Fall Risk Beliefs and Behaviours following a 'Good Fall':  
A Mixed Methods Study

(Spine Title: Fall Risk Beliefs and Behaviours following a 'Good Fall')

(Thesis format: Monograph)

By

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Graduate Program in Health and Rehabilitation Sciences

A thesis submitted in partial fulfillment  
of the requirements for the degree of  
Master of Science

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The University of Western Ontario  
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## Abstract

The purpose of this mixed method study was to understand self-reported behaviour and beliefs of community-dwelling older adults who have fallen once, and how they participate in fall prevention. In a serial case study of eight community-dwelling older adults completed three clinical balance tests, (the Timed Up & Go test, Berg Balance Scale and Biodex Balance System™ Fall Risk Test), three questionnaires addressing falls (Falls Efficacy Scale, Activities-specific Balance Confidence Scale, and Falls Behavioural Scale for the Older Person) and one-on-one interviews before and after an education session. The embedded design (Creswell 2007) was used to structure quantitative and qualitative data collection and analysis. Clinical balance test scores, questionnaire data and qualitative findings were not always aligned. The process of awareness revealed for fall prevention was not a linear, stepped process for these participants but rather a fluctuating curve of ‘having concern, being careful’, ‘accepting’, and action related to falls.

*Keywords:* fall prevention, beliefs and behaviours, mixed methods, older adults, grounded theory, serial case studies

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## CHAPTER 1

### Introduction

Falls are considered to be a major health concern among individuals aged 65 years and older (Huang, Gau, Lin & Kernohan, 2003). A fall is defined as an event that results in a person unintentionally coming to rest on the ground, floor, or other lower level (Clemson, Cumming, Kendig, Swann, Heard, & Taylor, 2004). Experiencing a fall can have detrimental effects on the older person within the community (Ruthig, Chipperfield, Newall, Perry, & Hall, 2007) as a fall can have negative connotations. Falls have been attributed to fractures (Ruthig et al., 2007), increased nursing home admissions (Tinetti, 2003), loss of independence (Hughes, van Beurden, Eakin, Barnett, Patterson, Backhouse, Jones, Hauser, Beard, & Newman, 2008), and psychological trauma (Hughes et al., 2008).

Even if a fall does not result in physical trauma it can often lead to an increased fear of falling (Yardley, Donovan-Hall, Francis, & Todd, 2006) and a loss of confidence in mobility (Moore & Ellis, 2008). Fear of falling can be as damaging as physical injury from a fall itself, as it has been linked to elevated levels of psychological distress (Yardley et al., 2006), depression (Clemson et al., 2004), and restriction of activity (Yardley, et al., 2006). Most older adults reside in the community (Lord, Menz & Sherrington, 2006) and value their independence (Lord et al., 2006), because of this, many older adults perceive their participation in fall prevention programs as a stigma (Yardley et al., 2006).

Prevention of falls is considered to be an important priority in the aging process as this could lead to decreases in physical injury as a result of falling (Hughes et al., 2008), decreases in the use of health and social services (Yardley, Beyer, Hauer, McKee, Ballinger, & Todd, 2007), and maintaining independence (Tinetti, 2003). During his presentation at a seminar on falls Dr. M. Speechley discussed how falls can be reduced by 25% with the current knowledge – this is the only health concern to older individuals that can make this claim (M.R. Speechley, personal communication, Jan. 20<sup>th</sup>, 2009). However because falls are multifactorial in nature (Close, Lord, Menz, & Sherrington, 2005) it is difficult to isolate one program that would be effective in reducing all falls (Yardley et al., 2007), however clinical trials have shown that fall prevention programs can reduce the incidence of falls (Yardley et al., 2007). Effective fall prevention programs may result in significant decreases in morbidity and mortality among the elderly (Shandro, Spain, & Dicker, 2007). Rubenstein (2006) reported that effective fall prevention programs are multidimensional in nature and should include balance training as well as an environmental assessment and modification. In order to be effective the targeted older adults must adhere to what was learned (Rubenstein, 2006).

The purpose of this study was to understand how an individual's fall risk, combined with an individualized fall prevention education session, influenced self-reported behaviour and beliefs of community-dwelling older adults who had experienced a 'good fall'. A 'good fall' was defined as a fall by an individual within the past year without injury as a result of their fall, or did not require any medical attention for a resultant serious injury. This fall experience was originally presented by Dr. M. Speechley in his keynote address

at Parkwood Hospital Research Day (M.R. Speechley, personal communication, Nov. 1<sup>st</sup>, 2007). By targeting individuals who have had a 'good fall' is an opportunity for secondary prevention. Fall risk, for the purpose of this study, was considered to be the participants' scores on three balance tests.

## CHAPTER 2

### Literature Review

Over the past two decades, falling has been increasingly recognized as a problem among older people (Tinetti, 2003; Ballinger & Clemson, 2006; Yardley et al., 2006). More than one-third of people over the age of 65 years fall each year (Yardley et al., 2006) and the incidence is higher among the very old and frail. However, serious falls are also incurred by fit and active older people (Yardley et al., 2006). A fall is defined as an event that results in a person unintentionally coming to rest on the ground, floor, or other lower level (Clemson et al., 2004). Experiencing a fall at an older age can have detrimental effects on both physical and mental health of an elder individual. Previous studies (Clemson et al., 2004; Ruthig et al., 2007; Tinetti, 2003) indicate that it is necessary to study and prevent falls at an older age as it can affect both the individual (e.g. fractures leading to death) and communities (e.g. increase in health care expenditures) (Ruthig et al., 2007). Older people have a higher risk of accidental injury that results in hospitalization or death than any other age group (McInnes & Askie, 2004).

#### *Falls and Health of Older Adults*

In a study conducted by Rubenstein (2006) it was found that falls and unstable balance ranked highly among serious clinical problems faced by older adults; gait and balance disorders or weaknesses were ranked second as a cause of falls in elderly people. A fall can happen at every age (Huang et al., 2003); however, falls become a major health

hazard to those individuals over 65 years. Over 80% of older persons admitted to the hospital as a result of a fall do not return to their previous level of independence (Hakim, Roginshki, & Walker, 2007). Ballinger and Clemson (2006) reported that the majority of falls by older people do not result in physical harm but around 5% result in fracture, of which 1% will be a femoral break. Falls become a health hazard to older adults due to the complex interaction of biomedical, physiological, environmental, and social factors (Huang et al., 2007), where this interaction among these factors can make even a relatively mild fall particularly dangerous to the well-being of the older person (Rubenstein, 2006). Experiencing a fall can have negative connotations for older people as they are associated with physical injury, functional impairment, psychological trauma, loss of independence, death (Hughes et al., 2008) and increased use of health and social services (Yardley et al., 2007).

Following a fall, an older person may experience one or more emotional problems including shame, depression, loss of confidence, anxiety, and fear (Hakim et al., 2007; Ballinger & Clemson, 2006; Yardley et al., 2007; Hughes et al., 2008). These negative repercussions have been recognized as major factors in older people's reluctance to admit both susceptibility to falls and the need for preventative behaviours (Hughes et al., 2008). Regardless of whether a fall causes physical trauma, having a fall can often create a loss of confidence in mobility (Moore & Ellis, 2008), and an increased fear of falling (Yardley et al., 2006). Fear of falling has been shown to increase with age and to be more prevalent in women than men (Lach, 2005). Fear of falling has been linked to elevated levels of psychological distress (Yardley et al., 2006), increased social isolation



(Yardley et al., 2006), depression (Clemson et al., 2004), decreased self-efficacy (Ballinger & Clemson, 2006), feelings of helplessness (Clemson et al., 2004), and activity restriction (Yardley et al., 2006). Activity restriction can further lead to decreased muscle strength, flexibility and coordination, as well as progressive functional decline that may cause a loss of independence and damage to identity, thereby increasing the risk for future falls (Moore & Ellis, 2008).

Falls in elderly persons have many component causes (Stevens, Holman, & Bennett, 2001) and these causes are based on external (extrinsic) or internal (intrinsic) factors (Akyol, 2007; Stevens et al., 2007; Shandro et al., 2007). Extrinsic factors are environmental hazards that can contribute to a fall, and are implicated in 33 to 50% of falls in elderly community-dwelling persons. The major environmental hazards listed in the literature are clutter, electrical cords in pathways, raised thresholds and slippery surfaces (Akyol, 2007; Rubenstein, 2006; Stevens et al., 2007; Shandro et al., 2007). Generally it was concluded that an increased risk for fall is associated with a greater number of environmental hazards (Wyman, Croghan, Nachreiner, Gross, Stock, Talley, & Monigold, 2007), however most environmental factors are modifiable (Akyol, 2007).

Intrinsic or internal factors refer to the normal physical and mental changes related to aging (but not associated with disease) that decrease functional reserves (Akyol, 2007).

Intrinsic factors can include issues of balance and illness (Shandro et al., 2007).

However, many falls attributed to accidents really stem from the interaction between

identifiable environmental hazards and increased individual susceptibility to hazards from the accumulated effects of age and disease (Rubenstein, 2006).

### Fall Prevention

It has been reported that one-third to almost three-quarters of falls in community-dwelling older adults occur at home (Wyman et al., 2007), and that these falls occur in the most commonly used rooms during peak activity periods (Close et al., 2005). It is therefore important to study elderly individuals at their homes as the majority of older people live in their own homes (Close et al., 2005).

Clinical trials have shown that fall prevention programs can reduce the incidence of falls (Yardley et al., 2007) and effective fall prevention efforts may result in a significant decrease in fall-related morbidity and mortality, among the elderly (Shandro et al., 2007). During his presentation on falls, Dr. M. Speechley discussed how falls in the elderly can be reduced by 25% with the knowledge that is currently available (M.R. Speechley, personal communication, Jan. 20<sup>th</sup>, 2009). However it was found that fall prevention is not always a conscious priority issue for older persons as they stated that falls were only of moderate concern when compared to other health concerns (Braun, 1998; Hughes et al., 2008).

Little is known about the level of awareness that older people have about falls injury risk, or their views about the concept of falls injury prevention, including the clinical services and activities that accompany fall prevention (Snodgrass & Rivett, 2005). There is very

little empirical research or theory focusing on the perspectives of older people about falling, or their participation in falls prevention initiatives (Ballinger & Clemson, 2006). It has been suggested that participation in fall prevention programs might label an older adult such that they would be reluctant to attend (Ballinger & Clemson, 2006). However, older individuals who have participated in fall prevention programs spoke of their participation as a form of insurance against future frailty and impairment (Ballinger & Clemson, 2006). The few qualitative studies (Yardley et al., 2007; Yardley et al., 2006; Yardley, Bishop, Beyer, Hauer, Gertrudis, Kempen, et al., 2006) that examine older people's views on falls prevention highlights how falls prevention advice is often regarded as useful in principle for the unspecified 'other' but not of personal benefit. Within these studies participants viewed the information they received about falls prevention as 'common sense' leading the authors to conclude that this had the potential to be patronizing and distressing to the participant. Ballinger and Clemson (2006) also noted that falls prevention information may be rejected by older people because it is seen as a 'potential threat to their identity and autonomy'.

Hughes et al. (2008) found that individuals who were involved in fall prevention programs were more likely to believe that falls were preventable and to prioritize the prevention of falls. They also discovered that elderly participants within their program favoured a fall prevention program that used the "stay independent" message, as independence was associated with feelings of pride and making one's own decisions.

### *Exercise for Fall Prevention*

The main goal in fall intervention programs is to reduce the risk of falling by minimizing the effect of or exposure to any supposed risk factor for falling (Peel, Steinberg, & Williams, 2000). Common elements of fall prevention are an exercise program, or an education component which can consist of a talk/group session (Lambert, Sterbenz, Womack, Zarrinkhameh, & Newton, 2001). Exercise programs, which include muscle strengthening and balance training exercises, have been found to be effective in prevention of falls (Tinetti, 2003). However this effect is usually within a short term, lasting one year or less (Yardley et al., 2006; Tinetti, 2003) and depends on the rates of uptake and adherence to the program (Yardley et al., 2007; Yardley et al., 2006; Tinetti, 2003). Uptake and adherence to interventions to encourage older adults to exercise is associated with a history of being physically active, lower levels of illness, greater self-efficacy, and a perception that exercise improves well-being (Yardley et al., 2006). Although exercise programs have demonstrated their effectiveness at reducing the rate of falling in elderly populations (Tinetti, 2003), typically fewer than half of those invited to take part in falls prevention interventions take up the opportunity (Yardley et al., 2006). It is therefore important to improve understanding of how prevention programs can be designed and presented so as to maximize acceptability and participation among older people (Yardley et al., 2006).

Participation rates in fall prevention programs vary widely in published clinical trials (Yardley et al., 2006) and this may be due to the content of the interventions (e.g. hazard

reduction vs. exercise), the format of the intervention (e.g. group vs. home based), how participation is encouraged (e.g. community action vs. health professional prescription), or how the population is sampled (e.g. unselected vs. high risk) (Yardley et al., 2006). Although the exercise component of fall prevention programs have been highlighted as the most effective strategy (Ballinger & Clemson, 2006; Lambert et al., 2001), there is new evidence to suggest that other elements within multifactorial programs may be equally, if not more important. Close et al. (2005) recommended that exercise needed to be part of a multifaceted approach in higher risk populations, and it needed to be progressed with a maintenance program undertaken in the long term as the benefits of exercise are lost when discontinued.

### *Education for Fall Prevention*

The second component of falls prevention programs is the educational aspect. Prior studies found a need for fall related education among community-dwelling older adults (Hakim et al., 2007). Snodgrass and Rivett (2005) showed that 50.7% of their respondents indicated they would like better access to education about healthy ageing and strategies to prevent falls. Also, participants discussed their difficulties with being unaware of what fall prevention services existed or how to access them. Traditional educational strategies in interventions for the prevention of falls have utilized two main messages: 1) falls are a significant health issue for older people, aged 65 and older, and 2) falls are preventable (Hughes et al., 2008). By utilizing this second message as a fall prevention strategy, researchers are able to overcome the misconception that falls are accidental and therefore not preventable.

Hakim et al. (2007) reported that the impact of education alone on reduction of fall risk is unknown and Tinetti (2003) found education alone to be ineffective as a sole intervention. However, education is an important component of the strategies to manage the risk of falling, because persons at risk to fall and their family members should be educated about the multifactorial nature of most falls, about the specific risk factors for falling that are present and about recommended interventions (Tinetti, 2003). Tinetti (2003) also recommended that for those individuals who are at risk for falling and who live alone, or who spend large amounts of time alone, be taught what to do if they fall and cannot get up, and that they should have a personal emergency response system or a telephone that is accessible from the floor.

In a study by Clemson et al (2004) called the 'Stepping on program' older community-dwelling participants engaged in a multifaceted falls prevention program in which a variety of learning strategies were used including: raising awareness by being more informed about factors that contribute to risk of falls, targeting those behaviours that have the most effect on reducing risk and reinforcing their application to the individual's home and community setting, and using specific techniques such as story telling, and group processes as a learning environment. This study was significant because it put the viability and efficacy of educational programs back on the agenda. It was a program based on an active rather than a prescriptive approach, promoting personal control, and problem solving as an opportunity for individuals to make behavioural changes (Clemson et al., 2004).

The 'Stepping on program' (Clemson et al., 2004) demonstrated the effectiveness of a multidimensional fall prevention program. Educational strategies are commonly used in multi-strategy fall prevention programs (Hughes et al., 2008). Rubenstein (2006) advocated that effective approaches to fall prevention programs should include multidimensional risk factor assessment tied to targeted interventions such as exercise programs, including balance training, as well as an environmental assessment and modification.

The best method for educating older adults on fall risk reduction remains unclear. However, it is possible to reach motivated individuals to make changes to reduce falls, as was demonstrated in a study by Hakim et al. (2007), in which participants made a total of 241 changes to decrease risk factors in their homes. As most fall prevention programs address multiple risk factors and are often delivered by interdisciplinary teams, it is difficult to isolate the most effective component of such programs although most evaluative research work has tended to focus on exercise (Ballinger and Clemson, 2006). Environmental adaptation is one strategy which aims to reduce the risk of falls by identifying and eliminating fall related hazards to change the environment and increase safety features while encouraging older people to self monitor and regulate safety features (Clemson, Cusick, and Fozzard, 1999). In a study performed to identify the cause of falls (Northridge, Nevitt, Kelsey, & Link, 1995) it was found that first falls were more likely to have had an environmental component than later falls, and that the percentage of falls classified as environmental was 46.8%. Northridge et al. (1995) also

found that the presence of certain home hazards (e.g. storage problems, clutter, hall rug problems) were more important in predicting falls at home among vigorous versus frail older persons.

### *Fall Risk*

It is especially critical to have studies that examine home-based behaviours and activities that predispose to falls (Northridge et al., 1995), as the majority of older persons live in their own homes (Close et al., 2005). Of these older adults, those who fall do so within their usual residence and in the most commonly used rooms during peak activity periods (Close et al., 2005; Northridge et al., 1995). Therefore, education and awareness should accompany efforts to make the home environment safer. Although, non-specific advice about modification of home hazards directed at groups of elderly persons with no history of falling has not proved effective, standardized assessment of home hazards by a health professional, along with specific recommendations and follow-up after a fall was associated with a 20% reduction in the risk of falling (Tinetti, 2003).

In a study by Clemson et al. (1999) a range of specific environmental factors contributing to falls were identified. These factors included stairways, obstacles in traffic ways, reaching and climbing, lighting, flooring, rugs, footwear, cluttered pathways, and railings. As most households contain these potential hazards, home safety assessment and household modifications have been suggested as integral components of falls prevention programs (Close et al., 2005; Peel et al., 2005). Most older people attribute



their falls to trips or slips inside the home or immediate home surroundings (Lord et al., 2006).

The relative contribution of home environmental hazards to the risk of falling remains uncertain (Lord et al., 2006; Stevens et al., 2001). The role of environmental hazards in increasing falls risk is by no means straightforward, and neither is the reduction of this risk by household modification (Lord et al., 2006). The complex interaction between an individual's physical ability and the challenges posed by their environment does not allow for a simple cause-and-effect relationship to be established (Lord et al., 2006). The varying levels of compliance with home safety recommendations limit the degree to which the efficacy of home hazard reduction can be demonstrated (Lord et al., 2006).

In Peel et al. (2000) environmental hazards were present in nearly all homes of elderly persons – an environmental hazard is defined as the physical element in the home that poses a potential fall risk. In this study an average of ten hazards per dwelling was found with the most common being the absence of suitably placed grab bars in the bathroom and/or near the toilet. The most recommended change to participants in this study was removal, repair or replacement of loose mats and rugs (Peel et al., 2000).

Wyman et al. (2007) used two groups in their study. The first group received a comprehensive fall risk assessment, exercise, education, individualized counselling including suggestions about home environmental modifications, and the second group received health education and was considered the control group. This study

demonstrated at follow-up that the fall prevention group had significantly fewer hazards than the control group. Wyman et al. (2007) suggested that in order to be most effective in reducing environmental hazards, fall prevention programs may need to provide and install safety devices, such as grab bars.

Studies estimating the effect of home environmental hazards on the relative risk of falling have reached varying conclusions, ranging from no association (Gill, Williams & Tinetti, 2000) to a significant association (adjusted O.R. = 3.1, 95% CI = 1.4 - 6.2) between obstacles that interfere with daily life and non-syncopal falls (Nevitt, Cummings, Kidd, & Black, 1989). Evidence that making the home environment safer is effective in preventing falls and injury is conflicting. Data from randomized trials has been proposed as a solution to this dispute (Peel et al., 2000). Results of intervention studies investigating the use of educational sessions or home modifications alone as a method to prevent falls have been ambiguous (Wyman et al., 2007). However, the reduction of known risk factors for falling, such as the removal of environmental hazards, remains a recommended strategy in fall prevention programs (Wyman et al., 2007). Home modification has the potential of long-term benefit from a one-time relatively inexpensive intervention (Stevens et al., 2001).

Much of the fall related literature has discussed the benefits of exercise; however there remains a gap in 'need' among elderly individuals for access on information on preventing falls. Previous studies have cited that elderly individuals who have had two or more falls is a good indicator of future falls (Tinetti, 2003), but there have been no

studies looking at this experience of a 'good fall'. Everyone experiences falls at some point in their lifetime, however when individuals reach about 65 years of age falling becomes detrimental to the well-being of these individuals. A 'good fall' in this study was defined as a fall without medical attention for physical injury, within one year of recruitment into the study. Focusing on these individuals presents an opportunity for secondary prevention.

This study was aimed at fall prevention and focused on participants' self perception of their fall, their risk of falling and their interpretation of fall risk values combined with a fall prevention education session. The literature identifies several fall risk factors, for example, age, number of health conditions, number of medications, impairments in balance, and environmental hazards (Stevens et al., 2007). The conceptual model used in this study weighted these factors equally on fall risk and was conceptualized according Figure 1.

The purpose of this study was to understand how an individual's fall risk, combined with an individualized fall prevention education session, influenced self-reported behaviour and beliefs of community-dwelling older adults who had fallen once. It is important to understand the nature of falls, and the detrimental effects it can have on elderly persons, especially those who live within the community and value their independence. In order to help elderly persons prevent falls it is best to understand what procedures and programs would be beneficial to them to maintain their valued independence. Such

information would facilitate increased participation in prevention programs as well as a decrease in falls that could be harmful to the elder person's health.

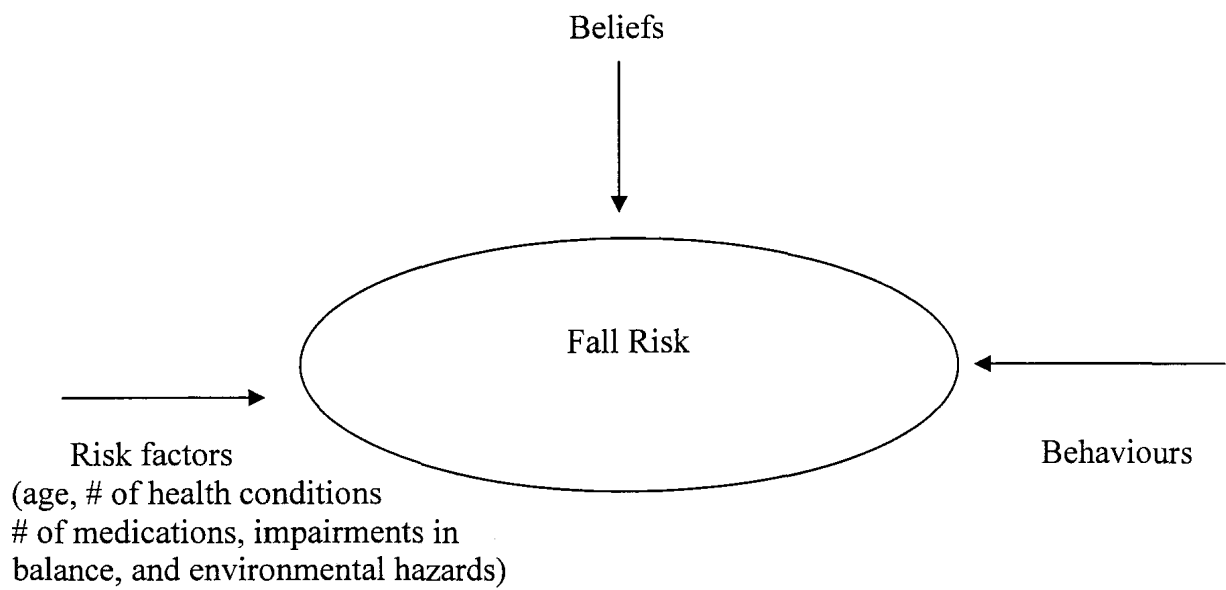


Figure 1: Represents the conceptual model used in this study.

## CHAPTER 3

### Study Design

This research study used a mixed method embedded experimental design to examine the fall risk behaviours and beliefs following a ‘good fall’ in community-dwelling older adults. A mixed methods research design was used because qualitative or quantitative data alone may not provide holistic findings (Creswell & Plano Clark, 2007) about the complex issue of falls in older adults. A mixed methods research design provides a structure for the collection, analysis and combination of the quantitative data and qualitative findings during a single study (Creswell & Plano Clark, 2007).

According to Creswell and Plano Clark (2007), there are four types of research designs within the mixed methods approach; these include triangulation, embedded, explanatory, and exploratory. This study used a modified version of the embedded experimental model. The modification was to simultaneously but separately collect quantitative and qualitative data, giving equal weighting to both types of data during collection and interpretation. By using this modified embedded design the researcher intended to bring together complementary data about older adults’ fall risk, and their beliefs and behaviours related to falls/fall prevention. In this version of the embedded model researchers are able to collect and analyze the quantitative and qualitative data separately on the fall risk topic and then combine the different results (e.g. by contrast and comparison) during the interpretation process, giving equal weighting during the collection and interpretation processes (Figure 2) (Creswell & Plano Clark, 2007).

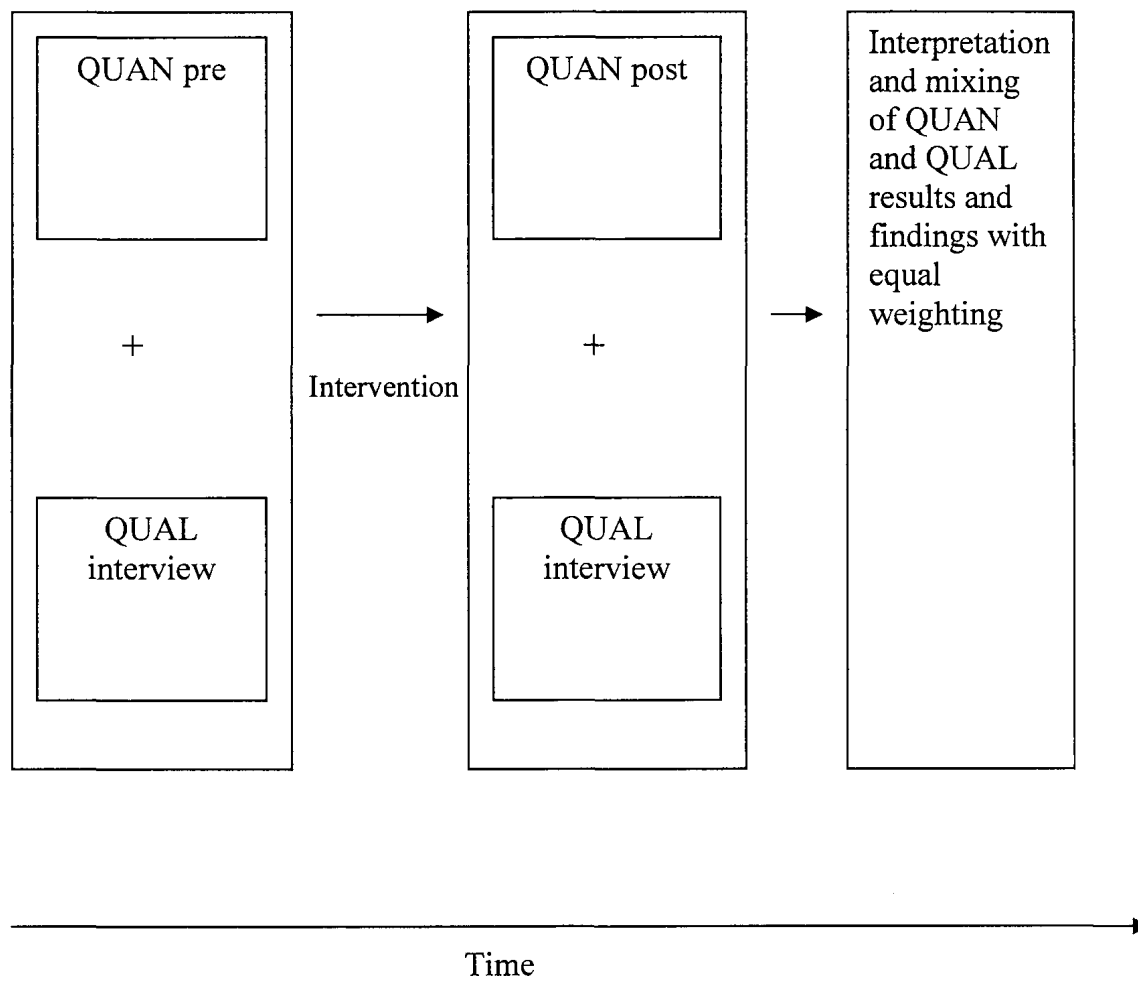


Figure 2: This figure depicts a modified embedded experimental model with simultaneous but separate data collection and equal weighting given to QUAN and QUAL data.

### Mixed Methods

Mixed methods is a research design with philosophical assumptions as well as methods of inquiry. As a methodology it combines a world view into the collection, analysis and mixture of qualitative and quantitative data throughout the phases in the research process. As a method it focuses on collecting, analyzing, and mixing both quantitative and qualitative data in a single study or series of studies (Creswell & Plano Clark, 2007).

Mixed methods research has the potential to offset the challenges inherent to quantitative and qualitative methods.

In quantitative research the context or setting and the voices of participants are not as clear as in qualitative research. The influences of the researcher's background, personal biases and interpretations on the data are seldom discussed. On the other hand, criticisms of qualitative research stem from the influence of the researcher's personal influences on interpretation of the data, the ensuing bias this may have created, and the difficulty in generalizing findings to a large group because of the limited number of participants studied (Creswell & Plano Clark, 2007).

Mixed methods research is 'practical' in the sense that the researcher is free to use a variety of different combinations of methods to address a research problem (Creswell & Plano Clark, 2007). It is also practical because there is an opportunity to solve problems using both numbers and words, to combine inductive and deductive thinking, and employ skills in observing people as well as recording performance. Mixed methods research

encourages the use of multiple worldviews or paradigms rather than the typical association of certain paradigms for quantitative research and others for qualitative studies. This research design also encourages us to think about a paradigm that might be applicable to both quantitative and qualitative research such as pragmatism (Creswell & Plano Clark, 2007).

Pragmatism has been recently put forward as the overarching worldview for mixed methods. Pragmatism attends to the practical nature of the individual's construction of reality which solves problems using a person's truth and, the consequences of objects and actions in their environment (Mead, 1964; Huber, 1986; Cherryholmes, 1992). In using pragmatism within mixed methods the researcher is allowed freedom of choice in methods, techniques, or procedures of research (Creswell, 2009). Within pragmatism researchers emphasize the research problem and use all approaches available to understand the problem (i.e. the use of both quantitative and qualitative approaches); pragmatism is not committed to any one system of philosophy (Creswell, 2009). The use of pragmatism within mixed methods research allows for the researcher to use different worldviews (i.e. post positivism and constructivism), as well as the use of different forms of data collection (i.e. surveys and interviews) and analysis (i.e. descriptive statistics and coding) (Creswell, 2009).

This study falls under the pragmatic umbrella as it incorporates the use of quantitative and qualitative methods in data collection and analysis, as well as the use of dual worldviews (i.e. use of post positivism and constructivism). The elements of post



positivism include determination, reductionism, empirical observation and measurement, and theory verification (Creswell, 2003). Within constructivism this approach has a focus on understanding multiple participant meanings or truths, social and historical construction according to the individual, and theory generation (Creswell 2003). A common element between post positivism and constructivism is that both methods accept the data as real and true for the individual. Pragmatism is used to answer practical questions which lend to a post positivist paradigm of measurement and can embody constructivism which provides individual realities constructed by practical life experiences. Because of this common element the researcher rationalized the use of these dual worldviews under the umbrella of pragmatism.

It can be difficult to merge two different worldviews in a way to provide meaningful results. There have been several arguments against using quantitative and qualitative methods within the same study as many believe that different paradigms can give rise to contradictory ideas and “contested arguments” (Creswell & Plano Clark, 2007). The basic argument is that in using different paradigms within one study there are bound to be tensions and oppositions that reflect different ways of knowing about (singular reality in post positivism vs. multiple realities in constructivism) and valuing the social world (unbiased in post positivism vs. biased) (Creswell & Plano Clark, 2007).

In mixed methods studies there are two options for the process for merging data. The first option is to transform data from one method into the same units as data from the other method, for example key phrases in qualitative data can be enumerated to provide

numerical data or quantitative data can be categorized to provide descriptive data (Creswell & Plano Clark, 2007). The second option is to preserve the data in its original form and proceed in a contrast and comparison process to find similar constructs within each type of data (Creswell & Plano Clark, 2007).

The gap in the literature that this study addresses is that the individual views of community living older adults about fall risk and prevention have not been studied in-depth (Yardley et al., 2006; Yardley, Bishop et al., 2006). The key challenge in falls prevention of older adults is the identification of those who at risk, using functional outcome measures. The usefulness of using outcomes to identify fallers has been challenged (Muir, Berg, Chesworth, & Speechley, 2008). Given the challenges of fall risk predictive tools and few previous studies about fall risk beliefs of older adults, this study employed equal weighting to both types of data. In this way, it was hypothesized that the limitations of the fall risk tools and the difficulties associated with self-reported findings would be minimized. For example, self-reported beliefs can be compared to quantified behaviours, or perception of fall risk from quantitative values can be compared to the individual's belief about their risk for falls. Combining the data with equal weighting would provide an opportunity for quantitative data to support qualitative data and vice versa.

### *Quantitative component of study design*

A serial case study approach (Portney & Watkins, 2009) was used to investigate the participants' level of confidence after experiencing a fall, their use of protective

behaviours within their homes, and an assessment of their balance. A case study approach allows for the researcher to explore conditions of the intended population, emotions, thoughts, and past and present activities as they relate to the focus of the study (Portney & Watkins, 2009). A major contribution of the case study to research is its ability to provide information that can be used to generate an inductive hypothesis. Because the case study allows for a thorough analysis of a single situation, it often leads to the discovery of relationships that were not obvious before (Portney & Watkins, 2009). This serial case study approach with an educational intervention was designed to understand those factors important to the fall, the uptake of home safety and fall prevention education, and to assess balance performance.

### *Qualitative component of study design*

Participants engaged in two one-on-one, semi-structured interviews – one interview before receiving fall prevention information, and the other interview after. The interviews were open ended in nature and aimed to understand the participants' views on their fall, fall risk, and their beliefs surrounding falls, for example, aging confidence.

### *Theoretical perspective*

#### *Background*

When performing qualitative research it is important for the researcher to state their theoretical perspective on what they believe is known about reality (Guba & Lincoln, 1994) as this determines the methodology, the course of the research and the quality or

style of the findings (Finlay, 2006). Grounded theory methodology first developed by B. Glaser and A. Strauss involved building a theory that was interpreted to be related to a particular situation from an objectivist view (Strauss and Corbin, 1998). Within this view of grounded theory, the theory developed was seen to be grounded in and connected to the data that evolves during the research process (Strauss and Corbin, 1998). Grounded theory methodology constitutes a variety of paradigmatic positions which represent different views on the nature of reality (ontology) and how we gain knowledge of what we know (epistemology) (Creswell, 2007). These paradigms range from post positivist (theory verification) to constructivist (theory generation) (Creswell, 2007). By using a constructivist paradigm the researcher places priority on the phenomena of study and sees that both data and analysis are created from shared experiences and other sources of data (Charmaz, 2006).

When grounded theory was first developed by Glaser and Strauss it used more of an objectivist approach which attends to data as real in and of itself and did not attend to the processes of its production (Charmaz, 2006). Objectivist grounded theorists assumed that data represented objective facts about a knowable world, and remained separate and distant from research participants and their realities (Charmaz, 2006). Kathy Charmaz offers another use of grounded theory, separate from Glaser and Strauss, in which she emphasizes flexible guidelines and a constructivist approach to data generation and analysis which does not use methodological rules, recipes and guidelines (Charmaz, 2006).

### *Constructivism*

Within constructivism participants provide their understandings; they speak from meanings shaped by social interaction with others and from their own personal histories (Creswell, 2007). In using this constructivist approach for this study, the researcher must look at more than how individuals view their situations and incorporate their own interpretation of what the individuals are experiencing. The researcher needs to acknowledge then that the resulting theory incorporates the researcher's view; the researcher is not objective and their worldview shapes the theory that emerges (Charmaz, 2006). The researcher can then construct grounded theories through their past and present involvements and interactions with people, perspectives, and research practices (Charmaz, 2006). Constructivist theorists take a reflexive stance, i.e., revisiting their biases and the data regularly, toward the research process and products, and consider how their theories evolve (Charmaz, 2006). In this way, both researchers and research participants interpret meanings and actions which help to develop theory (Charmaz, 2006). Without reflexivity, grounded theory researchers can import preconceived ideas into their work when they remain unaware of their starting assumptions (i.e. personal biases). Constructivism is different from the objectivist approach, in that it fosters researchers' reflexivity about their own interpretations as well as those of their research participants (Charmaz, 2006).

### Researcher's Paradigm

The researcher within this study used a constructivist paradigm, recognizing that everyone's interpretations of their experiences are based on multiple meanings and understandings according to their own life experiences, e.g., social and environmental inputs. As such, theory is constructed according to the stories relayed by participants to the researcher and from the researcher's interpretation of what they have been told. In this study I tried to understand how participants viewed having their first fall and how their experience was shaped by their previous life experiences. I recognized that each participant will attribute different meanings toward their fall based on their personal beliefs shaped by personal, social, and environmental experiences. Also, I tried to attend to the fact that my presence, at this particular moment in their life will shape their thoughts, words, and feelings about their fall.

### Components of Constructivist Grounded Theory

Charmaz offers several components which should be addressed when developing grounded theory from a constructivist paradigm. These components include theoretical sensitivity, theoretical sampling, saturation and constant comparison.

#### *Theoretical sensitivity*

In order to gain theoretical sensitivity the researcher must look at what phenomena they are researching from multiple vantage points, make comparisons, follow leads, and build on ideas. Charmaz maintains Glaser's use of gerunds when constructing grounded theory. Gerunds are verbs ending in '-ing' and as such they foster theoretical sensitivity

in the sense that these words nudge us out of static topics and into enacted processes (Charmaz, 2006). Gerunds prompt thinking about actions and can help the researcher focus on seeing sequences and making connections between their codes. Charmaz (2006) suggests that there should be a renewed emphasis on actions and processes, and not on individuals as a strategy in constructing theory; this should include moving beyond categorizing types of individuals.

### *Theoretical sampling*

According to Charmaz (2006), theoretical sampling is strategic, specific, and systematic (Charmaz, 2006); it directs the researcher where to go. The purpose of theoretical sampling is to obtain data to help explicate categories. When the categories are full they reflect the qualities of the participants' experiences and provide a "useful analytic handle for understanding them" (Charmaz, 2006). Engaging in theoretical sampling prompts the researcher to predict where and how to find needed data to fill gaps or to saturate categories. It can involve incorporating new participants or even going back to initial participants with new questions to inquire about experiences not covered before. Theoretical sampling will keep the researcher moving toward objectives such as: saturating the properties of a category, distinguishing between categories, clarifying relationships between emerging categories, and identifying variation in a process. (Charmaz, 2006). Theoretical sampling pertains only to conceptual and theoretical development; it is not about representing a population or increasing the statistical generalizability of the researcher's results (Charmaz, 2006).

### *Saturation*

Saturation occurs when gathering fresh data no longer sparks new theoretical insights, nor reveals new properties of core theoretical categories (Charmaz, 2006). Grounded theory saturation is not the same as witnessing repetition of the same events or stories – the most common use of the term saturation refers to nothing new happening – “I kept finding the same patterns” (Charmaz, 2006).

### *Constant comparison*

This involves comparing data with data to find similarities and differences. For example, comparing interview statements and incidents within the same interview and comparing statements and incidents across participant interviews. Comparing data in earlier and later interviews of the same individual(s) or comparing observations of a routine activity, comparing what happens on one day with the same activity on subsequent days (Charmaz, 2006).

### *Quality Criteria*

The issue of quality criteria within constructivist grounded theory has yet to be resolved without further critique (Seale, 1999). This is due to the methodological differences between objectivist grounded theory and constructivist grounded theory, which has different criteria for judging quality. When performing qualitative research it is essential that quality is established in order to determine the trustworthiness of the study (Seale, 1997). The tradition of Charmaz will be followed in this study to address what others



refer to as authenticity (Guba and Lincoln, 1994), transparency (Strauss & Corbin, 1998) or verification (Strauss & Corbin, 1998). Charmaz (2006) refers to credibility, originality, resonance and usefulness in determining the quality of the data.

### *Credibility*

Credibility, according to Charmaz (2006) refers to the extent to which the researcher has achieved familiarity with the setting or topic, whether or not the data collected was sufficient enough to merit claims made by the researcher, and whether the categories developed cover a wide range of empirical observations. Charmaz (2006) also states that credibility is achieved once the researcher has made systematic comparisons between observations and between categories, and that there are strong logical links between the gathered data and the researcher's analysis.

### *Originality*

Originality refers to whether or not the researcher's analysis has provided new conceptual rendering of the data, whether the research study has social and theoretical significance, and whether or not the categories developed offer new insights into the phenomena studied (Charmaz, 2006). Researchers use originality within grounded theory to challenge, extend, or refine the current ideas concepts and practices on the intended topic of study (Charmaz, 2006).

*Resonance*

Charmaz (2006) refers to resonance as a criterion in which the researcher has drawn links between larger institutions and individual lives according to the data. Resonance also refers to whether the categories developed portray the fullness of the studied experience, and if the theory that develops makes sense to participants or individuals who have shared their circumstances. In doing this the researcher's analysis should offer deeper insights about the participants' lives and their worlds (Charmaz, 2006).

*Usefulness*

This last criterion refers to whether or not the research that has been performed contributes to the existing knowledge on the topic, and whether the analysis performed by the researcher offers interpretations that people can use in their everyday worlds. It also refers to whether or not analysis of the data can spark further research in other substantive areas (Charmaz, 2006).

## CHAPTER 4

### Methods

#### *Overview of Protocol*

The purpose of this study was to understand how an individual's fall risk, combined with an individualized fall prevention education session, influences self-reported behaviour and beliefs of community-dwelling older adults who have already fallen once. The study was approved by the Health Sciences Research Ethics Board at The University of Western Ontario (Appendix A) and informed written consent was obtained from all subjects prior to participation.

Data from quantitative and qualitative methods were collected simultaneously (Figure 3). At Visit 1 the researcher met the study participant at their home. Participants were given a copy of the letter of information for the study, and were asked to sign the letter of consent (Appendix B). Participants were reminded that if for any reason they did not want to answer certain questions or did not want to be involved in the study they were not obligated to continue. Participants were required to fill out the Falls Behavioural Scale (FaB) for the Older Person (Clemson, Cumming and Heard, 2003), the Falls Efficacy Scale (FES) (Tinetti, Richman, & Powell, 1990), and the Activities-specific Balance Confidence (ABC) Scale (Powell & Myers, 1995) during this first visit (Appendix C). These measures provided baseline measures of these fall-related constructs. As well, subjects were invited to talk about their fall during a semi-structured interview using a script.

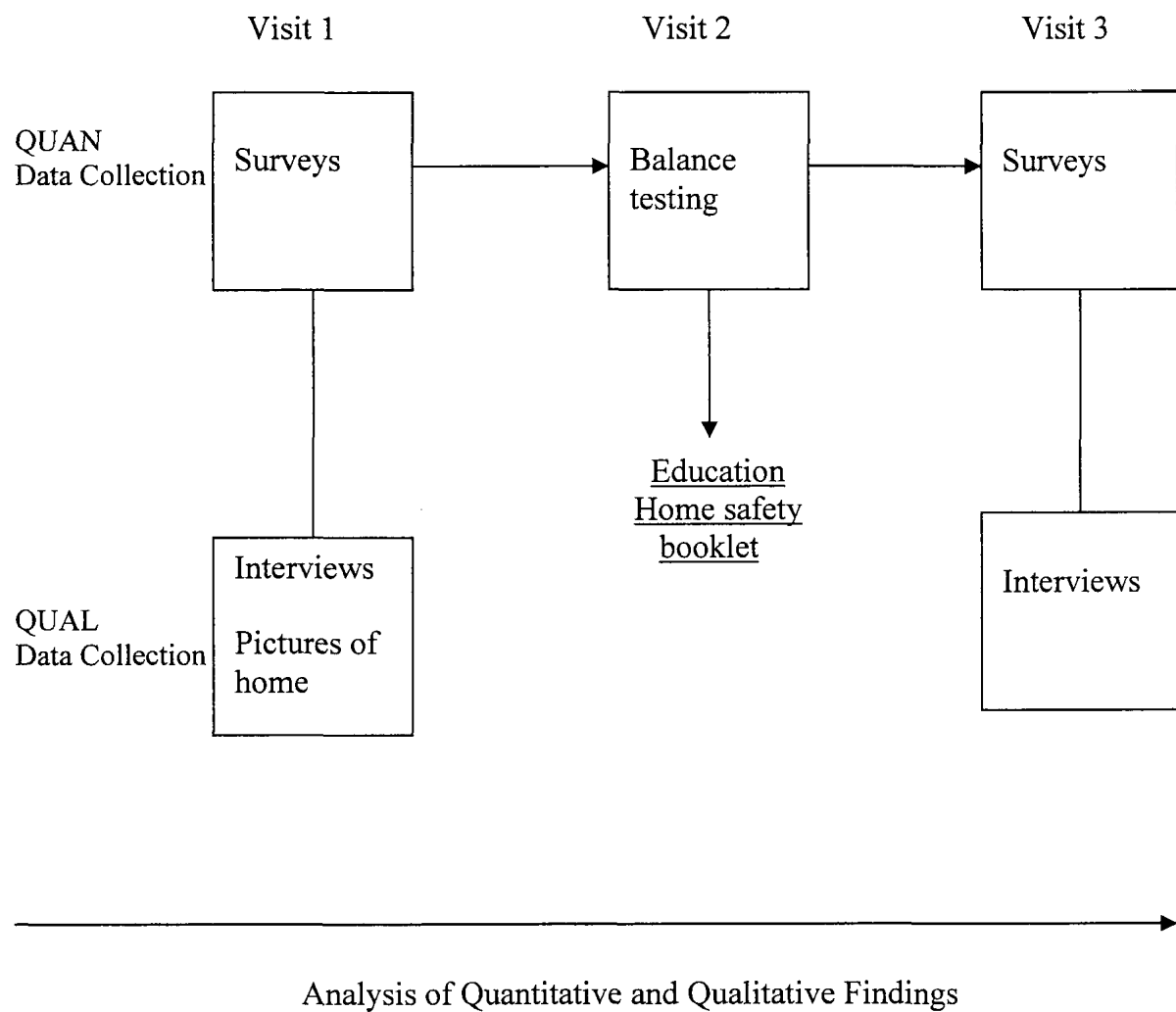


Figure 3: An overview of the study design describing the data collection and analysis process.

After the interview, photographs of the participants' homes were taken. Rooms which were more commonly used by the participants were photographed including the kitchen, living room, bathroom, bedroom, and hallways. These photographs were imported and compiled into a personalized booklet of the participants' own rooms in order to show which environmental fall risks within their homes could be changed in order to reduce/prevent future falls. A copy of the home safety checklist was included within the booklet of photographs (Appendix D).

A second visit (Visit 2) was scheduled approximately one week after the first interview. For this Visit, the participant came to the Chelsey Park Retirement Community where the participants' balance was tested using the Biodex Balance System™. Also, each participant performed a single trial of two clinical measures of balance: the Berg Balance Scale (BBS) (Berg, Wood-Dauphinee, Williams, & Gayton, 1989) and the Timed Up and Go (TUG) (Podsiadlo & Richardson, 1991) (Appendix E). Fall risk assessment was completed first followed by the BBS and the TUG. Assessment of fall risk on the Biodex Balance System™ required three 20 second trials with a 10 second rest period between trials (Appendix E). Participants were told that if they felt unsteady or uncomfortable at any time to inform the researcher and the testing would halt until they were ready. Adequate rest was provided between tests to reduce any influence of fatigue on participant performance.

During Visit 2, participants received a 'falls intervention'. After the three tests of balance were completed, participants were given a report of their Biodex Balance System™ falls

risk, BBS, and TUG scores. Participants also received their personalized booklet with a home safety checklist and a brief educational session about fall prevention (Appendix F). The researcher took great care in using the same method of delivery and providing the same information to each participant (even though the booklets were individualized). The participants left with a reminder that the researcher would be following up with them in one month.

About one month later, the researcher returned to the participant's home to complete a second interview (Visit 3). At Visit 3 participants were interviewed for the second time, in order to understand whether their beliefs about their fall risk had changed or remained the same. Also, participants were required to complete the FaB, FES, and ABC in order to determine if their scores indicated a change in their behaviours and confidence after being involved in this study.

### *Recruitment*

Posters about the study were displayed in Cherryhill Village Mall, London ON, doctor's offices, and an apartment building complex located near the Mall as part of the recruitment effort (Appendix G). Potential study participants from Chelsey Park Retirement Community, London ON were initially contacted by S. Hammond (Director, Chelsey Park Health Club). Contact information for the potential study participants from the Chelsey Park Health Club was provided to the researcher. Potential volunteers who saw the posters called the researcher to inquire about the study. The researcher phoned each potential study volunteer to ask if they were interested in participating. If they were

interested, the study was then explained to them and they were screened for memory impairment using the telephone version of the Mini-Mental State Exam (T-MMSE) (Roccaforte, Burke, Bayer, & Wengel, 1992) (Appendix H). Once participant eligibility was confirmed any questions the volunteer had about the study were answered, and the researcher scheduled an appointment for the first interview to take place in the participant's home.

### *Participants*

A total of eight to 10 participants were sought for inclusion in the proposed study. Participants were included if they were at least 70 years of age or older, lived in the community, spoke and read English, had fallen once in their home within the past 12 months, and did not require medical attention for any injury from the fall. Participants were excluded if they had any uncontrolled medical conditions, which was defined as requiring a change in any prescription within the past six months, and/or scored lower than 17 out of 22 on the T-MMSE (Roccaforte et al., 1992).

### *Screening Measures*

#### *Telephone Mini-Mental State Exam (T-MMSE).*

The Mini-Mental State Exam (MMSE) is used to assess cognitive impairment and its severity (Folstein, Folstein, & McHugh, 1975). The telephone version of the MMSE (T-MMSE) was developed because personal contact with the participant is not always possible (Roccaforte et al., 1992). The T-MMSE was used within this study in order to reduce the burden on those study volunteers who did not meet the inclusion criteria for

the study. The T-MMSE includes questions related to orientation, registration, attention and calculation, recall, and language. It has a cut-off score of 17 with a maximum score of 22 (Roccaforte et al., 1992). The T-MMSE version correlates highly with the original MMSE (Pearson  $r = 0.85$ ) and also correlates moderately to highly with the original MMSE for subjects with different degrees of dementia: intact cognition ( $r = 0.54$ ), questionable dementia ( $r = 0.73$ ), mild dementia ( $r = 0.78$ ), or moderate dementia ( $r = 0.85$ ) (Roccaforte et al., 1992). The T-MMSE has also been shown to be highly sensitive (67%) and specific (100%) in a population of community-dwelling older adults (Roccaforte et al., 1992). Inter-rater reliability was reported using an Intraclass Correlation Coefficient (ICC) (ICC = 0.80-0.90) (Metitieri, Geroldi, Pezzini, Frisoni, Bianchetti, Trabucchi, 2001). Test re-test reliability was only reported in the Italian version of the T-MMSE (ICC = 0.90-0.95) (Metitieri et al., 2001).

### *Health Questionnaire*

The researcher went through a health questionnaire (Appendix I) with participants in order to understand if there were any medical circumstances that may have prevented them from participating. There were no psychometric properties of this questionnaire as it was used to understand whether there were medical circumstances that would affect the participants' balance (e.g. a diagnosis of Parkinson's disease). This health questionnaire was a modified version of the Health History and Activity Questionnaire (Rogers, 2005)



### **Quantitative Data Collection**

#### *Home Safety Checklist*

Participants received a home safety checklist with their personalized booklet of photographs of their home in which fall risks were identified. The home safety checklist was a modified version of a previously developed home safety checklist put together by Dr. D.M. Connelly (personal communication, March 2008, D.M. Connelly).

#### *Falls Behavioural Scale for the Older Person (FaB)*

The FaB was developed as an assessment tool to evaluate the kinds of day-to-day behaviours and actions by older adults that protect them from falling during daily activity (Clemson et al., 2003). FaB assesses awareness of and practice of behaviours that could potentially protect against falling (Clemson et al., 2003; Clemson, Bundy, Cumming, Luckett, 2008). The FaB contained 30 questions that ranked from 1 (never does the action) to 4 (always doing the action). If a question did not apply to an individual there was the option to mark “doesn’t apply” and this was scored as zero. Scores for the questions were interpreted as a score of 4 meant the use of more protective behaviours than a score of 1. The FaB was found to have internal consistency (Cronbach alpha = 0.84), and high test-retest reliability (ICC = 0.94,  $p < .01$ ) for total FaB mean scores between the first data collection and the re-test. The FaB is an easily completed, reliable, and valid tool for determining the presence or absence of protective behaviours (Clemson et al., 2003; Clemson et al., 2008). There were no known psychometric properties for the FaB. FaB has both indoor and outdoor activities that relate to protective behaviours, for

this study the indoor statements were used in order to assess the participants' behaviours and actions related to fall prevention while in their home.

### *Fall Efficacy Scale (FES)*

The Falls Efficacy Scale (FES) was developed as an instrument to measure fear of falling based on the operational definition of fear as low perceived self-efficacy or confidence at avoiding falls (Tinetti et al., 1990). Tinetti et al., (1990) defined fear of falling as an individual who has a lasting concern about falling and if this concern leads to the individual avoiding activities they are still capable of doing, for example vacuuming. Self-efficacy here is defined as an individual's belief in or confidence in their capabilities to perform a specific activity successfully (Tinetti et al., 1990). The FES measures how confident an elderly person feels in performing a range of activities of daily living without falling (Tinetti et al., 1990). The FES measures confidence on a scale from 1 (very confident) to 10 (not confident at all) about performing various activities of daily living within the elderly person's residence – a total score of 70 indicates a person has a fear of falling (Tinetti et al., 1990). This scale has excellent reliability, Pearson's correlation  $r = 0.71$  (Tinetti et al., 1990) and is correlated with measures of balance and gait, and predicts future falls and decline in functional capacity in elderly individuals (Yardley, Beyer, Hauer, Kempen, Piot-Zielgler, & Todd, 2005). It is also important to note that the FES has proven sensitive to change in fears following clinical interventions (Yardley et al., 2005).

### *Activities-specific Balance Confidence (ABC) Scale*

The ABC includes a more situation-specific measure of balance confidence, has a wider continuum of activity difficulty and, more detailed activity descriptors as compared to the FES (Powell & Myers, 1995). Both the FES and the ABC are used to measure the most common and best studied fall related psychological issues: falls efficacy and balance confidence (Powell & Myers, 1995). Balance confidence is defined as the confidence in one's ability to maintain balance and remain steady (Powell & Myers, 1995). The ABC is a 16 item scale in which elderly participants are asked to rank their confidence that they will lose their balance or become unsteady in performing the activities outlined in the scale (Powell & Myers, 1995). Items on the scale are ranked 0% (no confidence at all) to 100% (complete confidence) (Powell & Myers, 1995). Items on this scale were summed and divided by 16 in order to report participants' balance confidence.

Individuals who score below 50 on the ABC are considered to be at a low level of balance confidence; those who score between 50 and 80 are at a moderate level of balance confidence, and those who score above 80 are considered to have a high balance confidence. The ABC was found to be reliable with a Cronbach alpha at 0.96 which indicates a high internal consistency (Powell & Myers, 1995), and it was also validated against the Physical Self-Efficacy Scale scores  $r=0.49$ ,  $p<0.001$  and the Falls Efficacy Scale scores  $r=.84$ ,  $p=0.001$  (Powell & Myers, 1995). The ABC scale measures balance confidence both indoors and outdoors and for the purpose of this study only those questions related to indoor activities (questions one to seven) were analyzed.

### *Berg Balance Scale (BBS)*

The BBS was developed as a functional measure of balance impairment in elderly individuals (Berg et al., 1989). The BBS is composed of a 14 item questionnaire which has to be performed in a standard order (Berg et al., 1989) and each task is scored on a five point scale (0-4) according to the quality of the performance or the time taken to complete the task, as ranked by the test developers (Thorbahn & Newton, 1996). The maximum score for the BBS is 56 and scores below 45 have been interpreted to indicate when someone is at an increased risk of falling (Berg et al., 1989 & Berg et al., 1992) or will need an assistive device at a later stage in life (Berg et al., 1989, & Berg et al., 1992). The tasks on the BBS include sit to stand, stand to sit, stand and sit unsupported, transfer bed to chair, stand eyes closed, stand feet together, reach forward, pick up an object from the floor, single-leg stance and tandem standing, turn and look over each shoulder, turn 360°, and stepping (Berg et al., 1989). The BBS has demonstrated high inter-rater and intra-rater reliability (intraclass correlation coefficients = 0.98 and 0.98, respectively), and good internal consistency (Cronbach alpha = 0.96) (Berg et al., 1989; Berg, Wood-Dauphinee, Williams, & Maki, 1992).

### *Timed Up and Go (TUG)*

The TUG is a test of balance that gives a valid and reliable determination of an individual's functional mobility (Podsiadlo & Richardson, 1991). The TUG test measures self-selected gait speed and chair rising ability and is therefore relevant to activities of daily living (Podsiadlo & Richardson, 1991). The TUG test has been reported to possess high inter-rater and intra-rater reliability (ICC = 0.99) in elderly

populations (Podsiadlo & Richardson, 1991). It has also been reported that the TUG is a sensitive and specific indicator of whether falls occur in community-dwelling older adults, and it appears to be a valid method for screening both level of functional mobility and risk for falls in community dwelling older adults (Shumway-Cook, Brauer, Woollacott, 2000). Podsiadlo and Richardson (1991) reported that older adults who took longer than 30 seconds to complete the TUG were at a higher risk of falling, however Shumway-Cook et al. (2000) stated that older individuals living within the community should have a cut-off of 14 seconds. Shumway-Cook et al. (2000) stated that the 30 second cut-off within Podsiadlo and Richardson's study was due to the inclusion of older adults with known neurologic diseases.

For the TUG test, the participant was seated in a chair (seat height ~45cm) with armrests (Podsiadlo & Richardson 1991). Wearing shoes and with their usual gait aid (if required), the participant was instructed to rise from the chair, using the armrests if necessary, walk three metres, turn, return to the chair and sit down. Each participant was instructed to walk safely at a "normal" pace. Timing started when the subject's back left the back support of the chair. A strip of tape, located three metres away from the chair, was placed on the ground and served to indicate the turning point. Timing stopped when the subject's back touched the chair back with the participant seated in the original starting position.

### *Biodex Balance System™*

The Biodex Balance System SD™ (Biodex System<sup>a</sup>) quantifies the ability of an individual to maintain dynamic balance on either a static or unstable surface (Biodex Medical Systems Inc. Balance System SD operational/service manual, 2007). The Fall Risk Test (FRT) on the Biodex system was used for this study because normative values are available for this test up to the age of 80 years. FRT results are compared to age dependent normative data (Biodex manual, 2007). Scores higher than normative values suggest further assessment for lower extremity strength, proprioception (the ability to sense the position, location, and movement of the body and its parts), and vestibular or visual deficiencies (Biodex manual, 2007).

Falls risk test results are reported as an overall stability index (SI) (Biodex manual, 2007) with an actual score and a standard deviation. The overall SI represents the variance of foot platform displacement in degrees from level anterior/posterior (A/P) and medial/lateral (M/L) during a test. A high number on the SI indicates a lot of movement during a test; it is the angular excursion of a participant's center of gravity. The starting point for a perfectly balanced stance is represented as center of balance (COB) x=0 and COB y=0.

Calculation of the SI is represented in the following equation:

$(SI)^2 = \sqrt{(\sum (0-x)^2 + \sum (0-y)^2 / \text{number of samples})}$  and  $SI = \sqrt{SI^2}$ . Participant SI scores were evaluated by comparison to a range of SI scores provided for age matched healthy individuals. Normative SI values for healthy individuals 54-71 years of age ranged between 1.4 and 3.4. Normative SI values for healthy individuals 72-89 years of age ranged between 1.9 and 3.5 (Biodex manual, 2007).

<sup>a</sup> Biodex Medical Systems Inc. Shirley, New York, 11967-4704

During testing the participants completed three trials of 20 seconds each at level 8 out of 10 possible levels, with 10 second rest periods between trials. A minimum of three test trials should be done to estimate balance performance, and avoid excessive balance deviations. The mean of the three trials was used as the Falls Risk Test value. On the Biodex system, the individual stands on both feet, shoulder width apart evenly from midline of the surface. A Fall Risk Assessment report can be printed with a specific score for each participant for comparison to normative data. Previous studies of the Biodex Balance System™ indicate accurate, reliable assessment of balance performance (Biodex manual, 2007). Other studies suggested that this measure of balance was correlated to functional activity performance, fall incidence, and fall direction (Biodex manual, 2007).

### **Qualitative Data Collection**

#### *Interview Guides*

The interview guides used were specifically developed for the current study, and the researcher ensured that the interview questions were relevant and appropriately addressed the purpose. Two interview guides (Appendix J) were created to explore the beliefs and behaviours of participants during their participation in this study. The answers that were received during the first interview informed the questions of the second interview guide.

The primary questions that were asked during the initial interview were:

1. Tell me about the day you fell.
2. Can you tell me about any bumps or bruises from the fall?
3. Describe what happened after the fall.
4. Tell me about anything that has changed since the fall.

5. Do you know other people your age who have fallen? What was their experience like? How do you feel you compare to them?
6. Tell me about the next time you fall.

During the interviews the researcher took extensive field notes and asked participants to clarify their thoughts or repeat themselves to ensure clarity for the researcher. The researcher also engaged in memo-writing after interviews as well as during the analysis and interpretation of the data. After the interview was completed, the researcher then took pictures of the participants' homes in order to design a personal booklet for the participant on fall prevention. The first visit ended with setting an appointment for the participant to test their balance on the Biodex Balance System SD™.

### *Second interview guide*

A second interview guide for the follow-up interview which occurred approximately one month later was specifically developed for this study. This second interview guide was driven by the answers received from participants during the first interview – this ensured that any questions that remained unanswered to the researcher during the first interview were answered. The primary questions for the follow-up interview were:

1. Tell me about what this fall risk score means to you.
2. Tell me about what you will do now that you know how you fair compared to others your own age.
3. Describe what you have learned by participating in this study.
4. Tell me about what the pictures mean to you and the way you think about falls.
5. Tell me about what you've done with the suggestions for modifications.
6. How do you feel about falling in your home and does it affect where you live?
7. What would falling more mean to you? What are your thoughts about how you may deal with falling in the future?
8. Tell me about what part of the study was not useful to you.



## **Data Analysis and Interpretation**

### *Quantitative Analysis*

Quantitative analysis for this study remained descriptive in nature. Frequencies of answers, range, and total number were used to describe the results of the FaB, FES, ABC, and the number of home safety modifications done.

### *Qualitative Analysis*

Each one-on-one interview was recorded and transcribed verbatim. In order to become acquainted with the data, the researcher repeatedly re-read the transcriptions, their field notes, and memos (Appendix K). This step allowed the researcher to be immersed in the data thereby leading to a data driven analysis (Charmaz, 2006). The researcher and their supervisor met several times to compare their understandings and coding of the interview content to approach a similar interpretation of the data.

The first analytic step taken was to code the data in the interviews using NVivo 7 software (Appendix L). This software was used to insert codes into the data and organize the coded data. Using the methods of Charmaz (2006), the researcher began by line-by-line coding, which required identifying those words of the participants that held meaning to the researcher. During this coding, the researcher aimed to generate ideas that may have escaped their attention during previous readings of the data. Line-by-line coding frees the researcher from becoming so immersed in the participants' worldviews that it would be easy to accept their views without question (Charmaz, 2006). Pure acceptance can lead to a failure in observing the data critically and analytically (Charmaz, 2006).

Line-by-line coding progressed into focused coding, in which the most significant and/or frequently found earlier codes were used to sift through the data (Charmaz, 2006). By engaging in focused coding the researcher moved across interviews, memos and field notes (observations) and compared participant's experiences, actions, and interpretations in order to create units of meaning (categories). The combination of categories led to the identification of themes (Charmaz, 2006).

Throughout this study, the researcher engaged in member-checking. Member-checking is associated with credibility within qualitative research and it contributes to the trustworthiness of the study. Member-checking is the process in which participants are able to read their interview transcripts in order to validate their words, and to review and confirm any preliminary analytic codes or interpretations made by the researcher (Charmaz, 2006). The participants in this study were allowed to review their transcripts and preliminary codes in order for the researcher to claim truthfully that these were their thoughts, opinions, and perceptions.

The researcher within this study maintained the use of gerunds as stated by B. Glaser and adopted by K. Charmaz. In the analysis and interpretation of the interviews the researcher held a focus on "action" words which the participants indicated were important to them. By focusing on these gerunds the researcher was able to develop a theory on how participants entered the process of awareness after having their first fall.

During the interpretation and analysis stage the researcher engaged in theoretical sampling (Charmaz, 2006). This occurred when the researcher recognized that some aspects of participants' interviews were not developed as well as previously thought. At this point the researcher contacted the participants and requested another meeting in order to gain clarification. For this study the researcher re-visited four participants in order to gain more information on their beliefs about fall risk. This led to saturation of the categories and indicated that more participants did not need to be recruited for the study. During the analysis stage of the interviews, constant comparison was used in order to compare interview statements of participants before and after the educational intervention and between participants.

## CHAPTER 5

### Results and Findings

#### **Participants**

Ten participants were screened for entry into this study. One participant did not meet the inclusion criteria because they fell outside; this was not clear until during the first interview. Another participant refused follow-up due to a lack of interest in continuing. Data for these two participants were not included in the analysis.

Full data were collected on eight participants (6 women, 2 men; mean =  $78.8 \pm 9.6$  years, range = 61-92 years). The most common reported chronic health conditions were arthritis (n=5), high blood pressure (n=5) and high cholesterol (n=4). All participants wore glasses and one man was scheduled for corneal transplant surgery. Five participants lived in single family homes, and three lived in retirement home apartments. Four participants used four wheeled walkers as gait aids and four used no gait aids (Table 1).

Table 1: A summary of participant characteristics

Participant	Age (years) Sex	# of health conditions	Place of residence	Gait aids	Location of fall	Reason for fall	Self reported health	ER care required	Support available (in home)	T-MMSE score
1	75 F	1	Home	None	Living room	Rug – tripped	Excellent	No	Husband	21
2	87 M	3	Home	None	Stairs	Not wearing orthotic – tripped	Excellent	No	Wife	20
3	61 F	4	Retirement home	4ww	Living room	Box – tripped	Very good	No	Retirement home staff	20
4	92 F	4	Retirement home	4ww	Doorway	Doorframe – tripped	Fair	No	Retirement home staff	20
5	78 F	5	Home	None	Stairs	Gym bag – tripped	Very good	No	None	20
6	73 M	0	Home	None	Kitchen	Faint	Very good	No	Wife	19
7	85 F	6	Retirement home	4ww	Living room	Tripped over feet	Very good	Yes	Husband	17
8	79 F	7	Home	4ww	Doorway	Not wearing orthotic - tripped	Very good	Yes	None	20

### **Fall risk factors**

#### *Health Questionnaire*

According to the literature (Tinetti, 2003; Close et al, 2005; Huang et al, 2003), every participant was at risk for falls because of their age, number of health conditions and/or number of medications, for example. Only one participant was younger than 65 years, and although this participant was 61 years of age they reported multiple fall-related health conditions (n=4), e.g., “when I shattered my pelvis [at age 46], it made the one leg shorter which means if I don’t have my shoes on, I’m liable to lose my balance even easier”.

The number of chronic health conditions reported by participants was from no diagnosed conditions (n=1) to eight different diagnoses (n=1). Tinetti (2003) stated that health conditions such as arthritis, depressive symptoms, impairment in cognition, vision, balance, gait or muscle strength, and the use of four or more prescription medications increase the risk of falling at an older age. Seven participants reported at least one of these fall-related chronic health conditions. Participant 2 reported problems with his vision, which was one of “two props [problems] really, vision is one and I’m looking down, it’s not the same as looking straight ahead.” Participant 4 discussed that she was “thankful that I’m as well as I am. I know I have depressions every once and a while”. The participant who did not report any chronic health condition, such as osteoporosis, cardiovascular or neurological disease, did sustain a stroke within the study period. This participant did not visit his family physician on a regular basis and therefore reported no

knowledge of his health conditions during screening using the health history questionnaire.

Participants self-reported their health to be from fair (n=1), very good (n=5) to excellent (n=2). Participant 1 explained that “when you’re well, you don’t feel any different from when you were 25 or that’s for me anyway.” The participant who reported fair health was “thankful that I’m as well as I am.”

Participants were included in this study because they had a fall in their home. The literature indicates that having had a fall is linked to future falls (Close et al., 2005). Falls were experienced in the living room (n=3), the kitchen (n=1), a door way (n=2) and going down stairs (n=2). The common mechanism for falling was ‘the trip’ (Table 1). One participant did report that their fall occurred secondary to a ‘faint’. This was the same participant who sustained a stroke within the study period, approximately 3-4 weeks following this fainting episode.

#### *BBS, TUG, and Biodex Balance System™ Falls Risk Test*

The results of the outcome measures (i.e., BBS, TUG, and Biodex Balance System™ Falls Risk Test) are summarized in Table 2. Results showed that three participants were below the BBS cut off score of 45 for community ambulation and were therefore at an increased risk of falling. These three participants were individuals who resided within a retirement home. Also, TUG scores for two of these three individuals indicated that they

were at risk of falling, i.e. greater than 14 seconds. TUG scores were variable (range = 5.5 to 14.3 sec) among those participants who lived in a single family home.

Biodex Balance System™ Falls Risk Test scores indicated that four of the eight participants had poorer balance ability than normative values for age-matched healthy peers. These were participants 2, 4, 5, and 6. Two participants had scores that did not fall on the normative Balance Index table for the Biodex Balance System™ Falls Risk test, this was due to: normative values for participant 4 age group was unavailable (> 90 years), and the other participant was unable to maintain their balance on the system. The two men in the study demonstrated the poorest balance scores of the group, lived in single family homes and lived with their spouse. The other two participants were women - one lived in a retirement home apartment and used a four-wheeled walker, and the other woman lived alone in a single family home. During the education session the actual values for participants as reported in Table 2 were given and explained using normative or cut scores according to outcome measure.



Table 2: A summary of quantitative results

Participant	# of home safety prevention changes	Indoor FaB pre score (/100)	Indoor FaB post score (/100)	FES pre score (/100)	FES post score (/100)	Indoor ABC pre score (/100)	Indoor ABC post score (/100)	Biodex Balance System™ score	Berg Balance score (/56)	Timed Up and Go score (seconds)
1	9	38.8	51.7	15	12	81.4	94.7	2.8	55	5.5
2	9	48.3	74.1	10	11	86.4	90.6	6.7*	47	14.3*
3	10	62.9	59.5	58	58	30.4	18.4	0.7	41*	13.4
4	11	51.7	55.2	13	21	68.9	41.8	4.9 <sup>x</sup>	43*	16.0*
5	10	60.3	57.8	23	40	70.6	63.6	3.5*	53	6.2
6	0	32.8	49.1	10	10	44.9	62.3	8.4*	53	6.5
7	13	55.2	59.5	82	59	51.3	30.0	3.1	41*	14.4*
8	2	52.6	62.1	82	89	8.7	31.4	1.6	48	12.1

- Indicates those individuals at risk of future falls according to the balance measures
- <sup>x</sup> Individual's fall risk on Biodex Balance System™ FRT not available for age group

### **Patterns in Quantitative Data**

There were patterns within the quantitative data that indicated six out of the eight participants were considered to be at risk of falling based on one or two of the fall risk measures (Biodex FRT, BBS, and TUG). This is supported by low scores on one or both of the self-reported measures of confidence (FES and ABC).

Also, there was a similar pattern found among participants who were considered to be at fall risk due their low scores on the FaB scale which looks at protective behaviours. Categorization of the meaning for the FaB scores was not found in the literature, and for the purpose of describing patterns among fall risk outcome measures and self-reported questionnaires, the group mean was used to dichotomize the data to indicate lower or higher than the mean score. Those participants who reported low protective behaviours on the FaB scale were considered to conform to the fall risk pattern.

### **Behaviours**

The behaviours of participants within this study were measured using the FaB scale and by the number of home safety prevention changes they made based upon what they learned during the education session. The results from the FaB scale showed that six participants increased their protective behaviours from the time of the first interview to the second interview. Of the two participants that did not increase their protective behaviours, one resided in a single family home, and the other in a retirement home apartment. The individual living in a retirement home indicated that upon receiving her balance scores (i.e., BBS, TUG, and Biodex Balance System™ Falls Risk Test) she

realized that she could manage her daily activities with more confidence, and stopped second-guessing herself.

#### *Home safety prevention changes*

Out of the 22 items listed on the home safety prevention checklist, participants reported changing anywhere from zero to 13 of the suggested items. The most frequent changes reported were an increase in lighting (n=6), keeping the phone within reach during the day and night (n=6), replace/install smoke detectors (n=6), not using a footstool (n=6), use of a nightlight (n=6), remove rugs (n=6), and keep a clear pathway to the bathroom (n=6) (Figure 4). As noted by participant 2 during their follow-up interview:

Oh yeah, well we changed things. We put better lighting in the basement stairway for one thing and got rid of a rug or two. Looking for a ladder, almost found one.

None of the participants made any change in their flooring, emergency response system, automatic shut-off kettle, suction cup bathmat, commode or hand-held showerhead.

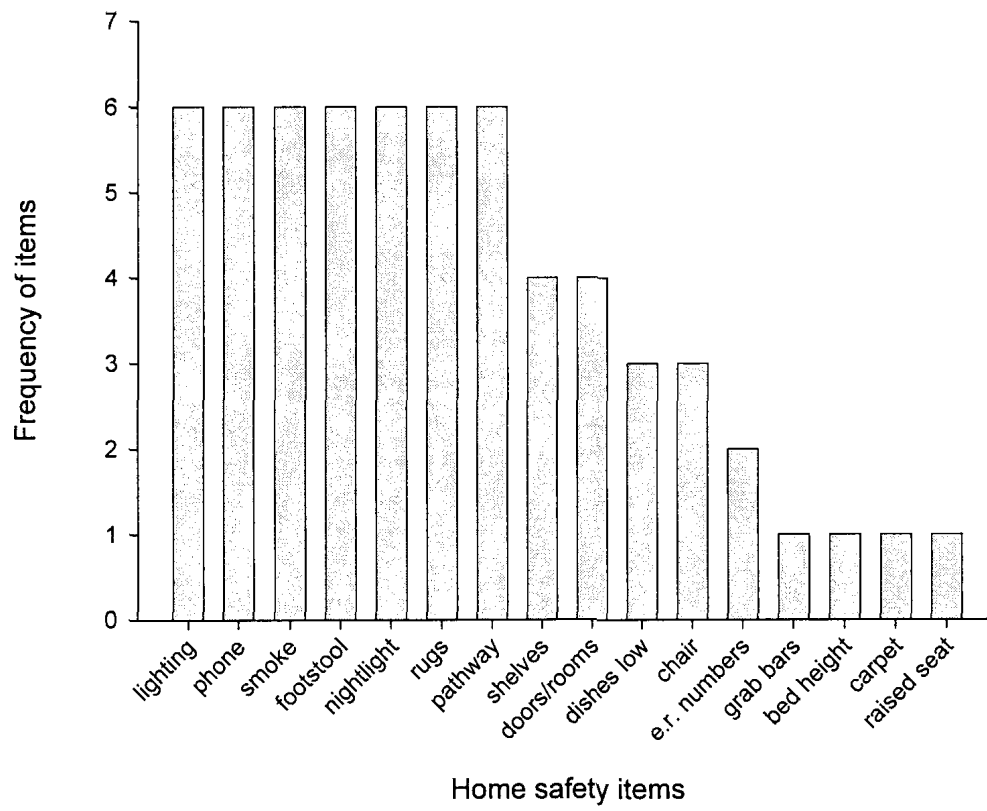


Figure 4: A graphical presentation of the most frequent items changed from the home safety checklist.

### **Beliefs**

Scores on the FES and ABC scales were used to assess the participants' self-reported confidence and self-efficacy related to falls during activities of daily living. Other information about issues of falling was gathered during interviews to obtain the participants' own perspectives and experiences surrounding their fall.

#### *Falls Efficacy Scale*

FES scores ranged from 13 to 82 for the group of participants who resided in retirement home apartments and all used a gait aid; a range of 10-23 (n=4) for those living in single family homes, and one participant scored 82. This individual lived in an apartment in the community and used a walker "I can't walk without [it], I wouldn't think of walking without some support." Results for the FES showed that Participants 7 and 8 had high initial scores (both over 80) which indicated lower self-efficacy. Participant 8 had a slight increase in FES scores post-intervention and also self-reported that without her walker she is much less independent than what she would like (FES pre = 82; FES post = 89). The same FES score from the initial to the second interview was maintained by Participants 3 and 6. Three participants had an increase in their FES scores post-intervention but were still under the cut-off score of 70. Participant 1 reported a slightly lower FES score during the second interview (i.e., FES pre=15; FES post=12), and self-reported her health and ability to get around as excellent.

### *Activities-specific Balance Confidence scale*

Participants 1 and 2 reported over 80% on the ABC scale during their first interview and increased their mean ratings to over 90% during the second interview. These two individuals had a high level of physical function, were the two most active participants within this study, and lived in single family homes.

Well I exercise three times a week in a pool at Chelsey and I carve twice a week down at the Senior Centre. (Participant 1)

Three participants scored above 50% but below 80% on the ABC scale during their first interview, which placed them at a moderate level of balance confidence. This level, 50% to 80%, is usually characteristic of older adults living in retirement apartments or older persons with chronic health conditions (Myers, Fletcher, Myers, & Sherk, 1998).

Participants 4 and 7 resided within a retirement home, while Participant 5 lived in a single dwelling home, and each reported having at least three chronic health conditions. However, during the follow-up interviews all three participants reduced their scores from the first interview. Only participant 5 remained in the moderate level of balance confidence, while participants 4 and 7 reduced their scores to below 50%. Participants 3, 6 and 8 reported scores below 50% during the first interview, which indicated a low level of balance confidence. Participant 3 reported a lower score during their second interview (ABC pre=30.4%; ABC post=18.4%), and Participants 6 and 8 indicated higher scores. Of the two participants reporting higher scores, one participant reported a balance confidence of 62.3% during their second interview which was a 17% increase from the first interview.

Scores for the ABC scale indicated that four participants (1, 2, 6, and 8) increased their balance confidence from the time of the first interview to the second interview, and the other four (participants 3, 4, 5, and 7) reduced their balance confidence indicating that they had lower confidence in maintaining their balance and remaining steady while performing activities of daily living.

### ***Interviews - Qualitative***

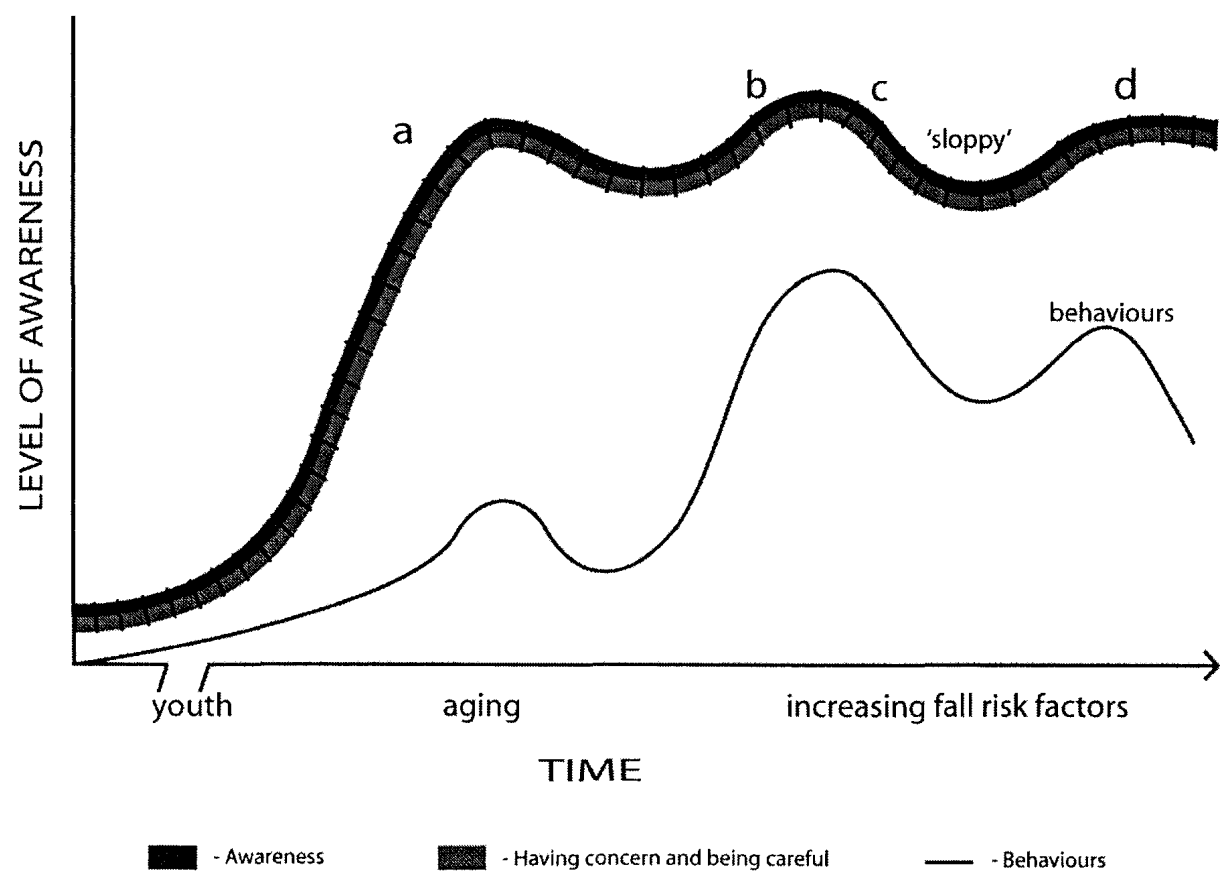
#### *Process of Being Aware*

The main theme that emerged was ‘being aware’. Two categories that became clear were ‘having concern and being careful’, and ‘accepting old age’. Based on our data, to enter the process of being aware of falls, an older adult must have fall risk factors, for example, chronic health conditions, a number of medications, mobility and/or balance impairment, and advanced age. The process of being aware of falls from the community-dwelling older adults’ own perspectives involved an input, a reactive behaviour/ belief about aging, and having care and concern with awareness of falls (Figure 4). The input (i.e., a fall or knowing someone who had fallen or the researcher’s visits) challenged them to think about falls and elicited reactive behaviour to address the input. Their beliefs that falls occur with aging was given as a reason for the fall. Together with these components of the process was having concern and being careful, which fluctuated similarly with being aware of falling. Figure 5 shows the qualitative findings that emerged from the interviews with participants, as well as the level of their reactive behaviours/actions based on their varying level of awareness. It was discovered that awareness was

increased over time when participants compared their level of current concern and age-related experiences with their concern about falling from their youth.

“When you’re well, you don’t feel any different from when you were 25 that’s for me anyway, it’s just when you look in the mirror and you say who the hell’s that?” (Participant 1)





- a - first input when the participant experienced their fall
- b- second input is when the participant was first interviewed for study
- c - third input is when the participant received fall risk assessment and education
- d - fourth input is when the participant was interviewed for a second time

Figure 5: This figure describes the process of awareness as experienced by participants in this study.

Actions taken by individuals in this study were dependent on their level of awareness – awareness was usually at a high point after a) experiencing their first fall, b) being involved in this study/contact with researcher, c) receiving their fall risk assessment, and d) having the follow-up to this study. When the participants experienced their fall, their action towards prevention was increased; however this action was specific to their fall. For example if the participant tripped over a rug in their living room then that rug was removed, but a rug in the hallway that could cause another trip was not removed from the household. After being involved in this study participants increased their actions to match what they had learned. No ‘patterns’ were found in their reported levels of balance confidence or falls efficacy scores, nor their beliefs about falls as they relate to getting older and the actions they made to prevent falls in their homes. The lack of patterns was interpreted to reflect the complexity of the falls and heterogeneity among the older adult participants in this study.

During this study, the primary theme related to falls that emerged was the process of increasing awareness over time as described by the participants. Participant 5 stated,

100% more aware, I’m 78 this year, if I’m not aware now, when would I ever be, you know you got to be.

After experiencing their first fall without injury, participants were at a heightened state of awareness, and this awareness included not only looking for areas of prevention but also having an increase in knowledge that having a fall can lead to detrimental effects.

Participant 3 explained that moving her rocking horse to a new place in her room was a hazard because she would forget where it was and trip over it.

Before I talked to you, having a fall, and not think anything of it but I can see where eventually it would lead to a bad fall because I didn't take the cause of the fall away.

During the course of this study participants discussed how their awareness remained at a higher level due to the balance testing, interviews and surveys over the two months they were involved in the study. After receiving their BBS, FES and Biodex Balance System™ FRT scores, participants relayed that this stimulated them to rectify fall-related problems within their home. Results from the Home Safety Checklist indicated that seven out of eight participants fixed at least two safety hazards from the checklist, and seven participants changed nine or more items from the checklist, which had a total of 22 suggested fall prevention items. Six participants increased their indoor FaB scores, which are interpreted as an increase in protective behaviours within their homes, and two participants decreased their FaB scores. Participant 3 was one of the individuals who decreased their score and during their interview stated that “I scored good, I stopped all that foolishness, second guessing myself... I wasn't so terrified and therefore more relaxed”. Participants also stated that participation in this study also motivated them to remain active and maintain their health; they also began to discuss their fall risk factors with others around them.

No this has inspired me to do all the things to rectify my problems...I'm determined to lose 10 pounds ... so you've inspired me .... I'm trying to stay as fit as I can for my age and I've always been quite strong so the thought of not being strong anymore is very, very upsetting to me. (Participant 1)

In addition to modifying their homes to prevent falls, and maintaining their health, participants also began to talk to other people about falling and what they did in the study that would help them prevent falls:

We had put a lot of thought in it [renovations] and my daughter had done the most because ...she read up on all things and went on the computer... before she even tried to put it [renovations] in here (Participant 7).

However, during the period in which the researcher was not in contact with the participants, some participants stated that their awareness decreased slightly. During this time they reported that they did not need to practice preventative methods: “You get kind of sloppy, so I think” (Participant 8). Awareness over the course of the study and over time increased and decreased with the positive and negative experiences of the participants. In the first interview, participants stated that having this first fall without injury was not a concern to them due to the fact that at younger ages they experienced multiple falls without consequence:

Well starting with that, when I was a kid I fell so darn many times and you just didn't keep track of them, you'd hurt but again, you'd get up and keep going. (Participant 2)

The pattern identified in Figure 5 shows the process in which participants increased and decreased their awareness at certain points in time. As they experienced their first fall the elderly individuals were at an increased state of awareness as they realized that some changes needed to be made in order for them to remain safe within their homes.

I had a fall and I didn't hurt myself thank goodness but it startled me and so for a while there I was watching each step I took, watching where I put stuff, memorizing, you know, sliding my feet along to feel ahead and I had never done that before. (Participant 3).

The actions of participants after their fall were limited to their basic ability to get around their homes. Upon entry into this study the participants did not make any changes to their homes, nor did they consult a medical professional on issues they may have had related to the fall.

I think I use my walker up here a lot more than I did before. I try to remember and it's hard to remember to bring the walker especially if you're carrying something and I try to bring it when I'm sitting down here so that when I go to get up I've got something to brace myself with. So I do that more. (Participant 7).

When the researcher began interviews with the participants it was at a point in which their awareness had decreased slightly. During the first half of the study, participants had to discuss their thoughts and perceptions on their fall, fill out surveys, and engage in balance testing as well as an educational session. These procedures increased awareness of the participants as well as the preventative actions they took in order to make their home safer. It is during this time frame that the actions participants took were at a high level. When the researcher contacted the participants for their follow up interviews, they stated that their awareness remained raised, and discussed the changes they made to their homes – as discussed by participant 8 when she puts on her orthotic to go to the bathroom, something she never did before.

I feel more aware since I did fall because now when I get up at night to go to the bathroom, light or no light and there's a light on all the time, the first thing I say is pick it [foot] up.

### *Having Concern and Being Careful*

The issue of “concern” (all Participants) and “being careful” (Participants 1, 3,4,5,7 and, 8) and/or “cautious” (Participants 2,3,4,6, and 8) emerged during the interviews. All individuals that agreed to participate in this study acknowledged that they were experiencing effects of aging and wanted to find out more about their risk of falling, “I am concerned about balance, it's nice to know cause I have to admit I am getting up there a little bit” (Participant 1). Fall risk factors for participants in this study was their age

(range 61 years – 92 years), and number of chronic health conditions (range 0 conditions to eight conditions). Further BBS scores indicated that three participants were at risk of falling (<45/56), and three participants were above the cut-off score of 14 seconds for the TUG. Two of these three participants were at risk according to both measures.

Initially participants stated that they maintained their childhood belief “you fall, you get up, and you get better” (Participant 2). Many participants stated that having the fall was not a concern to them: “no I don’t [think about the fall]. I don’t let it bother me” (Participant 6), and they refused to limit their daily activities. FES scores for participants demonstrated that six participants out of eight had scores indicative of individuals who were confident in performing activities of daily living. During follow up only one participant had a score of 89 which would be interpreted as having no confidence in performing activities of daily living. However the combination of having this fall and being recruited for a study on falling made participants realize that falling was a serious issue and that it was a concern to them – as Participant 5 stated “having this fall was a “wake-up” call and participants discussed how being involved with the researcher helped them realize any limitations they may have.

Talking to you was a real bonus and, well it gets you to review maybe when you answer the questions, the things like hey I used to do that and that and that and now I can’t do it that way, I’m doing it 50% instead of 80% ” (Participant 5).

The fall was seen as a motivating factor for these older participants to think about their fall risk and express a determination to prevent future falls:

How I’ll deal with falling? Well I haven’t thought of that because I don’t have any way I can connect to 911 in a hurry so I just, I’m going for the big prevention thing. (Participant 5)

Participants stated that they believed they were more careful than before and wanted to avoid any accidents that may make them dependent on other people, as stated by Participant 8, “I don’t want to be dependent on my kids or anybody else.” FaB scale scores for participants indicated that more than a half (five out of eight or 63%) increased their protective behaviours. They also stated that this cautious attitude extended to other people’s homes, in which they observed their environment and used the best preventative methods.

I would say, I think of it [fall prevention] almost constantly. When I make a move I think about it. It slows you down a bit but it’s a safer way to go. In other words, if you’re going up an escalator or down I take more care than I used to. On stairways I make sure I got a good firm grip on handles or handrails and like everybody should do I cross at the safety crossings with the lights and so on.  
(Participant 2)

During the follow-up interview, participants acknowledged that as they became more aware of falling and their fall risk, they also became more cautious of how they went about their daily activities, “I do take precaution at some times” (Participant 4). These elderly individuals did not believe that falling would be a limiting factor in their lives, however many talked about how they knew about the effects of falling and what the quality of life would be for them.

But now I feel that I have to be careful, I don’t want to end up with a broken hip or something like that and end my days that way. (Participant 4)

### *Accepting*

Participants in this study acknowledged an acceptance that “old age” was an important factor implicated in their fall. Most participants in this study were very active individuals who went about their daily routines without thinking of falls or the consequences a fall

can have. When the participants within this study had their fall they indicated that old age was the factor at play, “I’ve never fallen that way but ... I don’t know, old age is a lot of my problem” (Participant 4). Participants accepted the fact that they were getting older and along with being aware and cautious, they felt that accepting the aging process was important in understanding topics important in aging, e.g. falling.

“It’s not going to help to wish for things [perfect health] because they’re not going to happen and you just have to take care of what you’re doing and cope with it. That’s life” (Participant 7).

In accepting this aging process, participants discussed how they take every day “day by day” (Participant 6), and try not to worry about the future. They felt that when they were younger they did not have to think about every step they took; but now that they were aware that a fall could happen to them and what the effects may be of a more serious fall they engaged in more protective behaviours.

Yeah. I just watch what I do differently. I find the kitchen is the hardest place to be. It’s small, you’re twisting and turning quickly and you don’t want to so I always make sure I have a hold of the counter when I go to turn. (Participant 7)

Many participants talked about how they did not feel old, and one participant felt strongly about how “irritable it was to experience a fall” (Participant 1). For many of the study participants, having this fall was a signal of getting older and that maybe they were aging, and that they had to be more careful:

Well the whole procedure’s [falling] made me really irritable because I don’t really think I’m old but now I’ve been aware that I am ... so I better be more careful with what I do, so that’s a plus. (Participant 1).

When they acknowledged that they had to be more careful they also described having to accept that with aging they would have falls. Because they accepted falling as part of old



age their awareness of this idea was increased. Having a greater awareness then, participants were able to act on ways to deal with falls. The actions taken by participants in this study were linked to the effort they put into prevention (Figure 5). Effort, in this study, was assessed as the number of home safety changes they made, and what individuals expressed during their interviews about their personal efforts. Participant 5 discussed her efforts in keeping active and maintaining her health:

No, because there's no way you're going to go up unless you're doing something to 100% change what your body's doing. Take all the vitamins, I go to exercise, I walk around here as much as I can. Weather's good I do more. I don't know what else you can do at my age to prevent the natural onset of things, you know what I mean?

With the exception of one participant, the participants within this study made at least two home safety prevention changes according to the checklist that was incorporated with their personalized booklet. The one participant who did not make any changes was the individual who sustained a stroke.

The process of being aware of falling, as described by these participants, did not occur linearly, or in a step-by-step pattern in managing their first fall. Participants were dealing with several issues related to their beliefs and behaviours at the same time. Participants were concerned with living in their homes and falling again. They were more careful about how they moved and their surroundings. They believed that falls were to be expected with aging, and this first fall was an indicator of the effects of aging. All these things together heightened their awareness that varied in intensity over time.

### **Patterns in Qualitative Data**

Distinct patterns among self-reported falls experience were summarized according to categories and process – awareness, caring and concern, and accepting. A relationship was found between awareness and accepting (i.e. falls as part of aging) (Figure 5).

Awareness, based on self-reported home safety changes and daily life experiences, fluctuated similarly with having concern and being careful. Elements of the category care and concern are part of awareness which emerged through the grounded theory analysis. Given this it seems appropriate that these two constructs vary similarly in proportion and over time. Accepting emerged as a category primarily from the second interview. Participants often explained their fall as a component of aging and noting that they will get older they are going to have to continually have to accept it as a factor in their fall risk. Accepting could not be described further than the end of the study. The working assumption would be that the levels of acceptance would continue over time with increasing age.

## CHAPTER 6

### Discussion

#### *Awareness*

In this study, the primary finding was that older adult participants described a process of awareness after their first fall that led to a change in their behaviour related to fall prevention. Previous findings from studies of older adults who fell did not discuss issues surrounding awareness, but rather participants' opinions about an exercise program to prevent falls (Ballinger & Clemson, 2006) or adherence to fall prevention advice (Lambert et al., 2001). The purpose of this study was to understand how an individual's fall risk, combined with an individualized fall prevention education session, influenced self-reported behaviour and beliefs of community-dwelling older adults who had fallen once. Participants reported behaviour that supported reducing their indoor fall risk and sustained the beliefs that they were fine for their age, to live in their home, and to not fall again.

In the two months when participants were involved in the study, the level of awareness varied with fall-related experiences, such as the study related visits by the researcher and their fall. Some level of awareness persisted and did not seem to go away completely. Awareness seemed to be related to actions/behaviours and may have reflected participants' beliefs. One hypothesis is that the participants did have a sense that falls were harmful and had an underlying belief that a fall could happen again. Many participants did not explicitly say this as they may have seen this as an admission that

they were getting older and more susceptible to injury; injuries from falling then would compromise their independence.

### *Relationships in Quantitative and Qualitative Data*

A variety of patterns were found for participants among the self-reported and performance-based measures. Clinical measures of balance, which provided a fall risk, were sometimes related to self-reported beliefs among the participants. If the results of the clinical measures did match their self-reported beliefs about what happened for them to fall, then they said they were fine. Participant 3 performed well on the balance tests but her ABC scale score was lower upon follow-up after the intervention. She did say though that she had stopped second guessing herself when she found out her balance score and decided she was in better shape than she thought. If the balance results did not match their beliefs then they stated their disappointment with the results. But, they still maintained they were fine and talked about being more aware of fall prevention and about addressing some of the factors that could lead to a fall. For example, Participant 2, who was at risk for falls, stated he was not limiting his daily activities and if something needed to get done he would find a way to do it. However, he did make nine changes to his home and increased his protective behaviours by 26%. This belief that they were fine, as related to fall risk, was repeated during the interviews and across participant interviews, perhaps to convince themselves or the researcher.

### *Beliefs and Behaviours*

There were contradictory results between beliefs and behaviour. Some participants reported behaviours that did not match their self-reported beliefs. Participant 1 stated she was very independent, could manage on her own, did not let anything stop her, and did not feel she needed to make changes to her home; she did however make 9 changes to her home and increased her protective behaviours by 12.9%, according to her FaB score.

One hypothesis for the inconsistency between fall risk and beliefs may be that participants felt they were 'fine'. Reporting that they were fine may be a reflection of the social norm to provide a brief representation of their emotional and physical health. How people feel is often relative to their health, day-to-day activity or social environment. Perhaps there is more to the participant thinking they were fine and may be a topic to explore as it relates to aging at home, fall prevention behaviour, beliefs about fall risk, or beliefs about capability in future studies.

### *Disjoint between Beliefs and Behaviours*

'Fine' was not coded in the transcripts because in the context of the interview the researcher understood the participants' use of the word fine as an acceptable social response. As the interviews progressed, participants used words such as 'disappointed', 'doing okay', or 'been better' to describe their state of being, thoughts and beliefs surrounding the fall, rather than the first superficial description of 'fine'. These descriptors were coded rather than 'fine' for that reason. The significance of participants saying they were fine surfaced during reflection on why there was a disjoint between

performance and beliefs. Future studies may need to explore this hypothesis about being ‘fine’ further.

### *Questionnaire Data*

FES and ABC scales were used to evaluate the participants’ beliefs about their fall risk, and results from both scales indicated that the majority of participants in this study had high confidence in performing activities of daily living (i.e. FES score) and balance confidence (i.e. ABC score). During their first interview, participants discussed how they were not afraid to get the task at hand done, and that they did not think about their fall risk. After the intervention, participants stated how they were more cautious when performing daily tasks, and that they had become more aware of their fall risk and hazards that could cause them another fall.

At Visit 1, participants were required to complete the FaB, FES, and ABC scales as well as be interviewed about their fall. Most participants completed the surveys with minimal problems and asked for clarification when a question was unclear to them. Some participants had a hard time discussing their fall, these individuals preferred not to discuss the fall as they believed it “was no big deal” (Participant 6) and that they had “moved past it [falling]” (Participant 5). Use of the scales in this study was valuable for two reasons. Participants who did not offer a lot information about their fall provided details related to their fall through their answers to the questionnaires. Secondly, the questionnaires promoted discussion about their fall, and their beliefs and behaviours as

they went through the questions. Some of the FES and ABC content was similar but use of all three scales did contribute to the findings.

At Visit 2, all participants were interested in the Biodex Balance System™ and receiving their balance score. Anecdotally, participants thought that the machine was interesting and different from their usual experience with exercise and balance assessment for falls. They had been tested for balance at a health club before but were unable to remember the names of the tests. Participants scored well on the Biodex Balance System™ FRT and on the two measures of balance (i.e. BBS and TUG). Scores on the Biodex Balance System™ indicated that out of the eight participants in this study four had poor balance and were considered to be at an increased risk of future falls. Results also indicated that the two men in this study were the two participants that had the poorest balance. On the BBS and the TUG three participants had scores that indicated an increased risk of falling; these three participants resided within retirement homes.

At Visit 3 participants completed the FaB, FES, and ABC scales again in order to determine whether their beliefs and behaviours had changed following the balance assessment and education session. During this visit, participants completed another interview in which they discussed their thoughts, beliefs, and perceptions of their experience in the study. Participants were very happy with the falls education booklet and appreciated that it was specific to their home. They reported that they showed the education booklet to friends and family. The impact of the booklet was not an objective

of this study, however, it did seem to make an impression on them and they enjoyed the application of falls safety to their own environment.

### *Mixed Methods*

Results from the quantitative and qualitative aspects of this study were converged in order to give a detailed representation of the experiences of participants in this study. The converged data indicated that participants' self-reported behaviours, their score on the FaB scale and home safety changes were comparable. Participants stated that they made changes based upon what they learned within this study, and took increased protective behaviours when manoeuvring around their homes. Also, participants made changes within their homes based on the information acquired during the educational session, and from the home safety checklist, which was given to them with their personalized booklet.

Quantitative results and qualitative findings in this study reinforce that falls are a complex health-related issue, as previously reported in the literature for physical factors related to falls, such as muscle strength, vision, balance and mobility. The interview findings suggest that individual beliefs and behaviour are contributors to this complex health issue for older adults, as many of these individuals do not want to admit their susceptibility to falling and the consequences that can occur from experiencing a fall.



### *Differences in Findings with Previous Literature*

None of the participants spoke about fear in relation to falling. All participants spoke about ‘getting better’ from the fall and moving on. This is inconsistent with the literature stating that experiencing a fall can lead to fear of falling and restriction of activity (Powell & Myers, 1995). Participants in this study spoke more about having concern about their fall risk, but maintain that because of their increased awareness that a fall could happen again they are being more careful within their homes.

### *Limitations*

This study has several limitations. Quantitative statistics could not be completed for the questionnaires due to the small number of participants. Descriptive analyses of these data were reported instead. The reader may not be able to generalize the findings to all community-dwelling older adults for a number of reasons. The participants in this study were recruited from a community-based health club for older adults, all participants scored greater than 17 points on the telephone MMSE, and inclusion in the study eliminated those older adults with any neurological health conditions, dementia or use of wheelchair/scooter for mobility. This study recruited those individuals who fell in their homes, and not those who fell outside – which could lead to different results. Data were collected over a two month period of time. Insights into the effects of the education booklet and balance assessment over a longer time frame were not possible in this study. Older adults who fall may consider a fall to be a secret or something bad that may take away their independence. Because of the nature of this topic it was difficult to recruit older adults who were willing to discuss their first fall. Most participants in this study

were guarded about talking about their fall, and some participants said that if they fell again they would not tell anyone.

## CHAPTER 7

### Conclusion

The purpose of this study was to understand how an individual's fall risk, combined with an individualized fall prevention education session, influenced self-reported behaviour and beliefs of community-dwelling older adults who had fallen once. In this study it was found that participants increased their knowledge of fall risk and modified their behaviour to incorporate what they learned, as can be seen in the number of home safety changes most participants made, and the increases in their protective behaviours according to the FaB scale. The beliefs that these community dwelling older adults held of their fall risk did not differ by the end of the study, however, all participants reported their increased awareness to their environment, and methods they could use in order to prevent future falls.

The participants in this study were community-dwelling older adults who had experienced their first fall. This criterion proved to be difficult as all participants found it difficult to discuss the fall and what the implications of the experience could mean. As, this fall proved difficult to research it is believed that having the participants engage in individual assessments and educational sessions was ideal rather than being in a group discussing their fall.

*Future Research Directions*

This was the first study found in the literature to address beliefs about fall risk and behaviour surrounding fall prevention. The minimal change in personal beliefs about individual fall risk and falls may be relevant for future interventions to prevent falls. It was not possible during this study to complete another follow-up with participants after a longer period (e.g. six months or a year) to see if participants made any more changes to their homes or if they still practiced what they learned from the educational material.

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## Appendix A: HSREB Approval forms



## Office of Research Ethics

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## Use of Human Subjects - Ethics Approval Notice

Principal Investigator: Dr. D.M. Connelly

Review Number: 15107

Review Level: Full Board

Review Date: April 22, 2008

Protocol Title: Fall Risk Behaviours and Beliefs following a "Good Fall"

Department and Institution: Physical Therapy, University of Western Ontario

Sponsor:

Ethics Approval Date: June 03, 2008

Expiry Date: December 31, 2008

Documents Reviewed and Approved: UWO Protocol, Letter of Information and Consent, Advertisement

Documents Received for Information:

This is to notify you that The University of Western Ontario Research Ethics Board for Health Sciences Research Involving Human Subjects (HSREB) which is organized and operates according to the Tri-Council Policy Statement: Ethical Conduct of Research Involving Humans and the Health Canada/ICH Good Clinical Practice Practices: Consolidated Guidelines; and the applicable laws and regulations of Ontario has reviewed and granted approval to the above referenced study on the approval date noted above. The membership of this REB also complies with the membership requirements for REB's as defined in Division 5 of the Food and Drug Regulations.

The ethics approval for this study shall remain valid until the expiry date noted above assuming timely and acceptable responses to the HSREB's periodic requests for surveillance and monitoring information. If you require an updated approval notice prior to that time you must request it using the UWO Updated Approval Request Form.

During the course of the research, no deviations from, or changes to, the protocol or consent form may be initiated without prior written approval from the HSREB except when necessary to eliminate immediate hazards to the subject or when the change(s) involve only logistical or administrative aspects of the study (e.g. change of monitor, telephone number). Expedited review of minor change(s) in ongoing studies will be considered. Subjects must receive a copy of the signed information/consent documentation.

Investigators must promptly also report to the HSREB:

- a) changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
- b) all adverse and unexpected experiences or events that are both serious and unexpected;
- c) new information that may adversely affect the safety of the subjects or the conduct of the study.

If these changes/adverse events require a change to the information/consent documentation, and/or recruitment advertisement, the newly revised information/consent documentation, and/or advertisement, must be submitted to this office for approval.

Members of the HSREB who are named as investigators in research studies, or declare a conflict of interest, do not participate in discussion related to, nor vote on, such studies when they are presented to the HSREB.

Chair of HSREB: Dr. John W. McDonald

Ethics Officer to Contact for Further Information			
<input type="checkbox"/> Janice Sutherland	<input type="checkbox"/>	<input type="checkbox"/> Grace Kelly	<input checked="" type="checkbox"/> Denise Grafton

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cc: ORE File  
LHRI



## Office of Research Ethics

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### Use of Human Subjects - Ethics Approval Notice

Principal Investigator: Dr. D.M. Connelly

Review Number: 15107

Review Date: January 30, 2009

Revision Number: 1

Review Level: Expedited

Protocol Title: Fall Risk Behaviours and Beliefs following a "Good Fall"

Department and Institution: Physical Therapy, University of Western Ontario

Sponsor:

Ethics Approval Date: January 30, 2009

Expiry Date: August 31, 2009

Documents Reviewed and Approved: Revised study end date.

Documents Received for Information:

This is to notify you that The University of Western Ontario Research Ethics Board for Health Sciences Research Involving Human Subjects (HSREB) which is organized and operates according to the Tri-Council Policy Statement: Ethical Conduct of Research Involving Humans and the Health Canada/ICH Good Clinical Practice Practices: Consolidated Guidelines; and the applicable laws and regulations of Ontario has reviewed and granted approval to the above referenced revision(s) or amendment(s) on the approval date noted above. The membership of this REB also complies with the membership requirements for REB's as defined in Division 5 of the Food and Drug Regulations.

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Chair of HSREB: Dr. Joseph Gilbert

Ethics Officer to Contact for Further Information			
<input type="checkbox"/> Janice Sutherland	<input checked="" type="checkbox"/> Elizabeth Wambolt	<input type="checkbox"/> Grace Kelly	<input type="checkbox"/> Denise Grafton

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*Appendix B: Letter of Information and Consent form*

### **LETTER OF INFORMATION**

You are being invited to voluntarily participate in a study about falls risk and fall prevention education. Men and women, 70 years of age or older, who have fallen within their home in the past few months but did not hurt themselves are being invited to participate. If you fell outside your home and/or received medical care for any injuries from the fall, you will not be asked to participate in this study. This letter will provide you with information about the study and what you will be asked to do.

Please take some time to carefully review the information on this form. After you have finished, please feel free to ask any questions you have about the study and your participation.

#### **1. GENERAL INFORMATION ABOUT THIS STUDY AND THE RESEARCHERS**

**Study Title:** Fall Risk Behaviours and Beliefs following a “Good Fall”.

**Principal Investigator:** Dr. Denise Connelly  
Assistant Professor, School of Physical Therapy,  
The University of Western Ontario

**Co-Investigators:** Karen Gopaul  
BA Honors, MSc Health and Aging program  
The University of Western Ontario

Dr. Doreen Bartlett  
Associate Professor, School of Physical Therapy,  
The University of Western Ontario

Dr. Mark Speechley  
Associate Professor, Dept. of Epidemiology and Biostatistics  
The University of Western Ontario

#### **2. PURPOSE OF THE STUDY**

The purpose of this study is to understand how individual values of fall risk combined with individualized fall prevention education influence the beliefs and behaviours of community-dwelling older adults who have already fallen without injury.

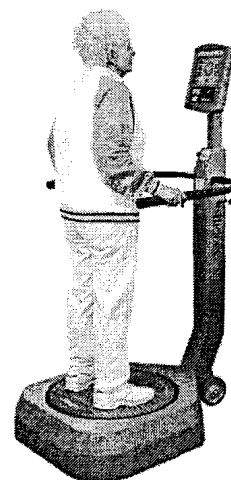
As individuals age falls become a major concern. Falls among community-dwelling older adults can result in fractures, and increased nursing home admissions. It is estimated that about one-third of community-dwelling adults older than 65 years, and 49% of those aged 72 years and older, fall each year resulting in severe health concerns. The focus of this study is to understand the perceptions older adults hold about falls and

their fall risk and whether or not knowing their own fall risk will make a difference in their beliefs and behaviours about falls.

### 3. INFORMATION ABOUT STUDY PROCEDURES

This study is comprised of an interview, followed by an assessment of your balance and then a second interview. The interviews can be done in your home at your convenience. The balance assessment will be done at Chelsey Park Retirement home in a research room. In the first interview, you will be asked to describe the events around your fall, e.g. what you were doing, why you think you fell, what was your day like that day, did you talk with someone about it and what happened after the fall. Then we will ask to take a picture of each of the rooms in your home. These pictures will be bound together in a booklet for you and attached to a Home Safety checklist. On completion of this study this booklet will be given to you to keep. We will review the checklist with you the second time we see you after you have had your balance measured. Other subjects will have their own pictures so your pictures will only be seen by you and the research team.

About a week after the first interview, we will meet you at Chelsey Park Retirement home on Oxford St., across from Cherryhill Mall, to assess your balance. This visit will take about 45 minutes. Your balance will be measured in three different ways using a machine called the Biodex Balance System™. The Biodex Balance System™ has a circular platform that you will stand on. The platform moves forwards and backwards, and side-to-side, and we can program how unsteady the platform is during testing. The Balance System has a handrail around it that you can hold if you ever feel unsteady. The person measuring your balance will watch you while you are standing on the platform and be close by if you need them.



For each of the three different ways we measure your balance we will ask you to do the test three times. The first time will be a practice and the next two times will we collect a score for your balance. Each test will last 20 seconds and at each visit you will be asked to complete a total of nine 20 s trials. A two minute rest break will be given between each 20 second trial. During the rest break you can step down from the platform, walk around or sit down as you wish. During the tests you will watch a dot on a computer screen which will show you how you are shifting your weight while you are completing the 20 second tests.

At the end of this balance test, we will tell you your results and go through the home safety checklist with you while we look through the pictures of your rooms. Any items on the checklist that we see will be pointed out to you so that you know about it. This booklet and the discussion about the items on the home safety checklist is to provide you with some knowledge about factors related to the risk for falling.

About one month after the balance test and giving you the pictures of your home, we will come to your home for a second interview. At this time we would like to ask you some questions about what you thought about having your balance tested, what you have been doing over the past four weeks, whether you fell again, and what you thought about the home safety checklist and the picture booklet.

#### **4. INFORMATION ABOUT RISKS**

Potential risks of this study may include heightened concerns of falling. Participants may be more aware of situations that may lead to a fall and may restrict certain activities, or misunderstand their own risk for falls. There may also be an increase in questions about your health due to the accumulation of information on falls.

#### **5. INFORMATION ABOUT BENEFITS**

There are no direct benefits to you for doing this study. You may increase your knowledge of falls, and how to prevent future falls, and have an opportunity to ask any questions you have about safety and falls.

#### **6. PARTICIPATION**

Your participation in this study is voluntary. You may refuse to participate, refuse to answer any questions or withdraw from the study with no effect on your future care. You may keep a copy of this Letter of Information for your records.

#### **7. CONFIDENTIALITY AND THE COLLECTION, USE AND DISCLOSURE OF YOUR PERSONAL INFORMATION**

All information collected for the study will be kept confidential. We will label your data with your initials and a number so that others would not know that it is your data. The data sheets will be stored in a locked cabinet in our research lab. A master list of all people in the study will be kept in a locked cabinet in a different place from the data sheets. Your labelled data will be entered on a computer that is password protected.

Your research data will not identify you by name. Your personal test information will be kept confidential. All the subjects' scores will be combined and reported as group data in any presentations we make or papers we write. The results of the study may be used in presentations or published in scientific reports but your name or identity will not be disclosed. Representatives from the University of Western Ontario Health Sciences Research Ethics Board may contact you or require access to your study-related records in order to monitor the conduct of the research. All personnel involved in the study are committed to respecting your privacy.

## 8. CONTACTS

If you have any questions about this project, please contact the principal investigator:

Dr Denise Connelly, [REDACTED] e-mail [REDACTED]

If you have any questions about your rights as a research participant or the conduct of the study, you may contact The Office of Research Ethics at The University of Western Ontario, at (519) 661-3036 or by e-mail at [ethics@uwo.ca](mailto:ethics@uwo.ca).

**Consent Form**

**Study Title:** Fall Risk Behaviours and Beliefs following a “Good Fall”.

I have read the Letter of Information, have had the nature of the study explained to me and I agree to participate. All questions have been answered to my satisfaction.

Participant Name (please print) \_\_\_\_\_

Participant Signature \_\_\_\_\_ Date: \_\_\_\_\_

Witness Name (please print) \_\_\_\_\_

Witness Signature \_\_\_\_\_ Date: \_\_\_\_\_

Person Obtaining Consent (please print) \_\_\_\_\_

Signature \_\_\_\_\_ Date: \_\_\_\_\_



Appendix C : FaB, FES, & ABC Surveys/Questionnaires

ID No. \_\_\_\_\_

### The Falls Behavioural (FaB) Scale for the Older Person

The FaB Scale is a list of 30 statements that describes things we do in our everyday lives. Please read each statement carefully.

Circle how much each statement describes the things you do in your daily life. For example:

Never	Some- times	<b>Often</b>	Always
-------	----------------	--------------	--------

Only circle 'Doesn't apply' if the situation is something to which you are not exposed (for example, if you do not have a phone).

Would this describe the things you do in your daily life?	Circle which one applies				
1. When I stand up I pause to get my balance.	Never	Some- times	Often	Always	
2. I do things at a slower pace.	Never	Some- times	Often	Always	
3. I talk with someone I know about things I do that might help prevent a fall.	Never	Some- times	Often	Always	
4. I bend over to reach something only if I have a firm handhold.	Never	Some- times	Often	Always	Doesn't apply
5. I use a walking stick or walking aid when I need it.	Never	Some- times	Often	Always	Doesn't apply
6. When I am feeling unwell I take particular care doing everyday things.	Never	Some- times	Often	Always	Doesn't apply
7. I hurry when I do things.	Never	Some- times	Often	Always	
8. I turn around quickly.	Never	Some- times	Often	Always	

ID No. \_\_\_\_\_

<b>Would this describe the things you do in your daily life?</b>	<b>Circle which one applies</b>
--	---------------------------------

**Now, these are things you do indoors**

9. To reach something up high I use the nearest chair, or whatever furniture is handy, to climb on.	Never	Some-times	Often	Always	Doesn't apply
10. I hurry to answer the phone.	Never	Some-times	Often	Always	Doesn't apply
11. I get help when I need to change a light bulb.	Never	Some-times	Often	Always	
12. I get help when I need to reach something very high.	Never	Some-times	Often	Always	
13. When I am feeling ill I take special care of how I get up from a chair and move around.	Never	Some-times	Often	Always	Doesn't apply
14. When I am getting down from a ladder or step stool I think about the bottom rung/step.	Never	Some-times	Often	Always	Doesn't apply

**Now, these are about lighting and eyesight**

15. I notice spills on the floor.	Never	Some-times	Often	Always	
16. I use a light if I get up during the night.	Never	Some-times	Often	Always	
17. I have made changes at home to make the lighting better.	Never	Some-times	Often	Always	
18. I clean my spectacles.	Never	Some-times	Often	Always	Doesn't apply
19. When wearing bifocals or trifocals I misjudge a step or do not see a change in floor level.	Never	Some-times	Often	Always	Doesn't apply

**Now, these are about shoes**

20. When I buy shoes I check the soles to see if they are slippery.	Never	Some-times	Often	Always	
---	-------	------------	-------	--------	--

**Now, these are things outdoors**

21. When I walk outdoors I look ahead for potential hazards.	Never	Some-times	Often	Always	
22. I avoid ramps and other slopes.	Never	Some-times	Often	Always	
23. I avoid going out on windy, icy or wet days.	Never	Some-times	Often	Always	

ID No. \_\_\_\_\_

Would this describe the things you do in your daily life?	Circle which one applies				
24. When I go outdoors I think about how to move around carefully.	Never	Some-times	Often	Always	
25. I cross at traffic lights or pedestrian crossings whenever possible.	Never	Some-times	Often	Always	Doesn't apply
26. I hold onto a handrail when I climb stairs.	Never	Some-times	Often	Always	Doesn't apply
27. I avoid walking about in crowded places.	Never	Some-times	Often	Always	
28. I keep shrubbery and plants trimmed back on the pathways to my front/back doors.	Never	Some-times	Often	Always	Doesn't apply
29. I carry groceries up the stairs only in small amounts.	Never	Some-times	Often	Always	Doesn't apply

**And, finally, these are about medications**

30. I ask my pharmacist or doctor questions about side effects of my medications.	Never	Some-times	Often	Always	Doesn't apply
---	-------	------------	-------	--------	---------------

Thank you for completing the Falls Behavioural Scale for the Older Person



## Falls Efficacy Scale

Name \_\_\_\_\_

Date \_\_\_\_\_

On a scale from 1 to 10, with 1 being very confident and 10 being not confident at all, how confident are you that you do the following activities without falling?

Activity	Score
	1 very confident 10 not confident at all
Take a bath or shower	
Reach into cabinets or closets	
Walk around the house	
Prepare meals not requiring carrying heavy or hot objects	
Get in and out of bed	
Answer the door or telephone	
Get in and out of a chair	
Getting dressed and undressed	
Personal grooming (i.e. washing your face)	
Getting on and off of the toilet	
Total Score	

*A total score of greater than 70 indicates that the person has a fear of falling*

Source: Tinetti, M., Richman, D., Powell, L. (1990). Falls Efficacy as a Measure of Fear of Falling. *Journal of Gerontology*. 45;239

## The Activities-specific Balance Confidence (ABC) Scale\*

### Instructions to Participants:

For each of the following, please indicate your level of confidence in doing the activity without losing your balance or becoming unsteady from choosing one of the percentage points on the scale from 0% to 100%. If you do not currently do the activity in question, try and imagine how confident you would be if you had to do the activity. If you normally use a walking aid to do the activity or hold onto someone, rate your confidence as it you were using these supports. If you have any questions about answering any of these items, please ask the administrator.

### The Activities-specific Balance Confidence (ABC) Scale\*

For each of the following activities, please indicate your level of self-confidence by choosing a corresponding number from the following rating scale:

0%   10   20   30   40   50   60   70   80   90   100%
no confidence <span style="float: right;">completely confident</span>

"How confident are you that you will not lose your balance or become unsteady when you...

1. ...walk around the house? \_\_\_\_%
2. ...walk up or down stairs? \_\_\_\_%
3. ...bend over and pick up a slipper from the front of a closet floor \_\_\_\_%
4. ...reach for a small can off a shelf at eye level? \_\_\_\_%
5. ...stand on your tiptoes and reach for something above your head? \_\_\_\_%
6. ...stand on a chair and reach for something? \_\_\_\_%
7. ...sweep the floor? \_\_\_\_%
8. ...walk outside the house to a car parked in the driveway? \_\_\_\_%
9. ...get into or out of a car? \_\_\_\_%
10. ...walk across a parking lot to the mall? \_\_\_\_%
11. ...walk up or down a ramp? \_\_\_\_%
12. ...walk in a crowded mall where people rapidly walk past you? \_\_\_\_%
13. ...are bumped into by people as you walk through the mall? \_\_\_\_%
14. ...step onto or off an escalator while you are holding onto a railing?  
\_\_\_\_%
15. ...step onto or off an escalator while holding onto parcels such that you  
cannot hold onto the railing? \_\_\_\_%
16. ...walk outside on icy sidewalks? \_\_\_\_%

\*Powell, LE & Myers AM. The Activities-specific Balance Confidence (ABC) Scale. *J Gerontol Med Sci* 1995; 50(1): M28-34

*Appendix D: Home safety checklist and example of Booklet*

## HOME SAFETY

### Home Checklist

#### Throughout the home

- ☐ Remove throw rugs
- ☐ Secure loose carpeting
- ☐ Use nonskid wax on floors
- ☐ Remove or highlight thresholds in doors between rooms
- ☐ Increase lighting
- ☐ List emergency numbers on phone
- ☐ Keep phone within reach
- ☐ Consider telephone emergency alert system
- ☐ Smoke detectors

#### Kitchen

- ☐ Store commonly used dishes on low shelves
- ☐ Avoid shelves above easy reach
- ☐ Don't use a footstool or a chair
- ☐ Use a kettle with an automatic shut off after boiling

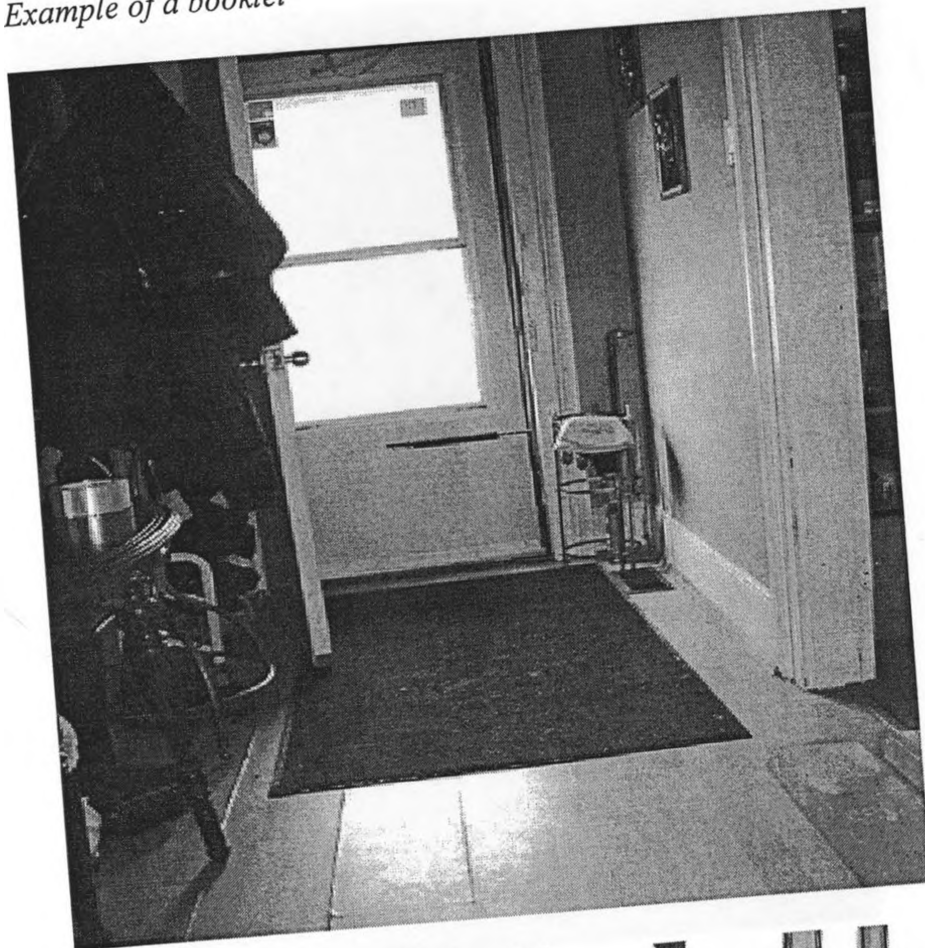
#### Bathroom

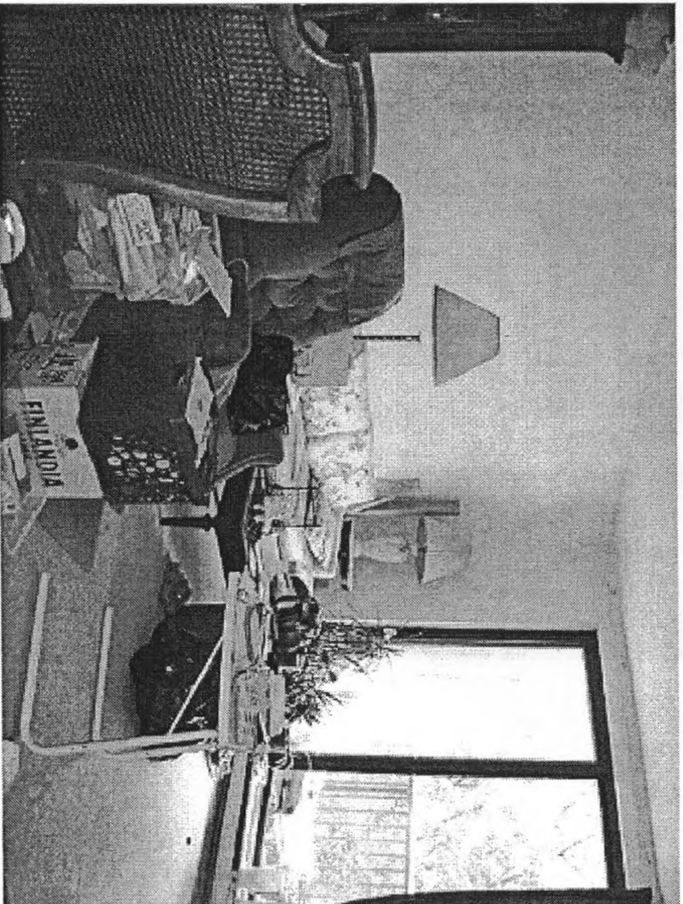
- ☐ Use a rubber bathmat
- ☐ Install a showerhead extender
- ☐ Use a shower chair with a back and nonskid tips
- ☐ Install grab bars in shower and tub; and beside toilet
- ☐ Use a raised seat or arms for toilet
- ☐ Use a nightlight

#### Bedroom

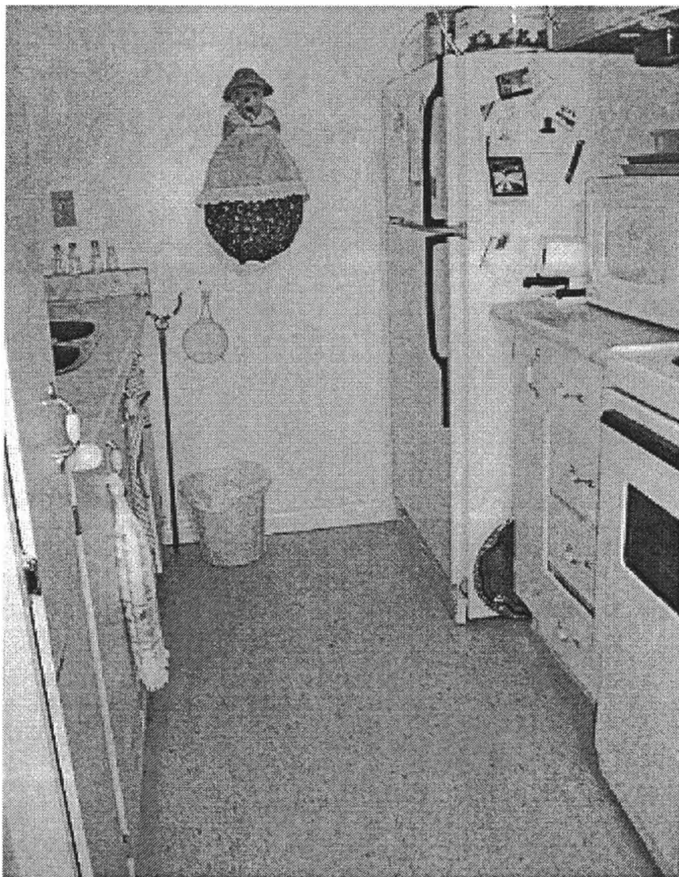
- ☐ Bed height is best when both feet are flat on the floor when sitting at the edge of the bed
- ☐ Consider using a bedside commode or urinal
- ☐ Clear a pathway to the bathroom

*Example of a booklet*









*Appendix E: BBS, TUG, & Biodex Balance System™ FRT*

**Berg Balance Scale**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Location: \_\_\_\_\_ Rater: \_\_\_\_\_

ITEM DESCRIPTION	SCORE (0-4)
Sitting to standing	_____
Standing unsupported	_____
Sitting unsupported	_____
Standing to sitting	_____
Transfers	_____
Standing with eyes closed	_____
Standing with feet together	_____
Reaching forward with outstretched arm	_____
Retrieving object from floor	_____
Turning to look behind	_____
Turning 360 degrees	_____
Placing alternate foot on stool	_____
Standing with one foot in front	_____
Standing on one foot	_____
Total	_____

## Timed Up and Go (TUG) Test<sup>1,2</sup>

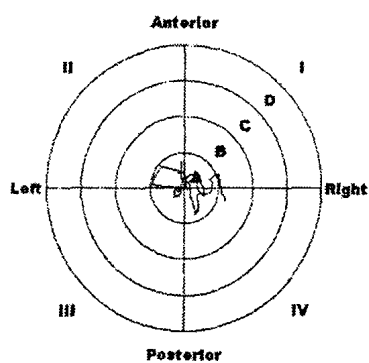
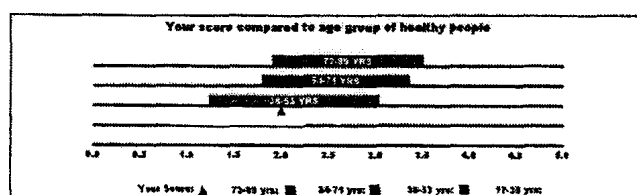
1. Equipment: arm chair, tape measure, tape, stop watch.
2. Begin the test with the subject sitting correctly in a chair with arms, the subject's back should resting on the back of the chair. The chair should be stable and positioned such that it will not move when the subject moves from sitting to standing.
3. Place a piece of tape or other marker on the floor 3 meters away from the chair so that it is easily seen by the subject.
4. Instructions : "On the word GO you will stand up, walk to the line on the floor, turn around and walk back to the chair and sit down. Walk at your regular pace.
5. Start timing on the word "GO" and stop timing when the subject is seated again correctly in the chair with their back resting on the back of the chair.
6. The subject wears their regular footwear, may use any gait aid that they normally use during ambulation, but may not be assisted by another person. There is no time limit. They may stop and rest (but not sit down) if they need to.
7. Normal healthy elderly usually complete the task in ten seconds or less. Very frail or weak elderly with poor mobility may take 2 minutes or more.
8. The subject should be given a practice trial that is not timed before testing.
9. Results correlate with gait speed, balance, functional level, the ability to go out, and can follow change over time.
10. Interpretation
  - < 10 seconds = normal
  - < 20 seconds = good mobility, can go out alone, mobile without a gait aid.
  - < 30 seconds = problems, cannot go outside alone, requires a gait aid.

A score of more than or equal to fourteen seconds has been shown to indicate high risk of falls.

1. Podsiadlo D, Richardson S. *The Time "Up & Go": A Test of Basic Functional Mobility for Frail Elderly Persons*. Journal of the American Geriatrics Society 1991; 39(2): 142-146
2. Shumway - Cook A, Brauer S, Woolacott M. *Predicting the Probability for Falls in Community-Dwelling Older Adults Using the Timed Up & Go Test*. Physical Therapy 2000 Vol 80(9): 896-903.  
Saskatoon Falls Prevention Consortium, Falls Screening and Referral Algorithm, TUG, Saskatoon Falls Prevention consortium, June, 2005

### Fall Risk Test Results

Name: RRP Height: 5'7.25"		Age: 45	Date: 09/26/2007 3:11 PM
Foot Placement		Protocol	
Foot Angle:	Left: 15 Right: 15	Platform Setting: 8-2	
Heel Position:	Left: 0.5 Right: 0.5	Test Trial Time: 10	
Overall Stability Index:		Actual Score: 2.9	STD Dev: 1.06



Comments:

Clinician:

9-6: Fall Risk Test Report.

## *Appendix F: Outline of information given at educational session*

### Key areas considered:

Cause of a fall is multi-factorial, involving both the individual and the environment and what causes a fall in one person may or may not cause a fall in another person.

Activity level is one key to an individual's well being and sense of confidence. Activity level is based on the individual's preference and includes social, mental, and physical benefits.

Compliance is a critical factor in fall prevention.

Financial constraints should be taken into consideration when recommending changes.

### Activity

Activity is one key to reduce the risk of falls. With activity there is a good degree of self-confidence. Activity needs to be enjoyable to the individual, such as gardening, walking, water aerobics. Type of activity is personal choice, because some people prefer individual activity and some prefer group activity. Just getting out of the house may be of great benefit.

### Use of assistive devices

A properly fitted cane, walker, or assistive device should be in good condition. Although viewed as a stigma of old age, a cane may prevent a fall. It should be noted that a learning curve does occur with the use of a cane because it is another object that needs to be manipulated. Some individuals need time to adjust to an assistive device before it becomes second nature.

### Home Assessment

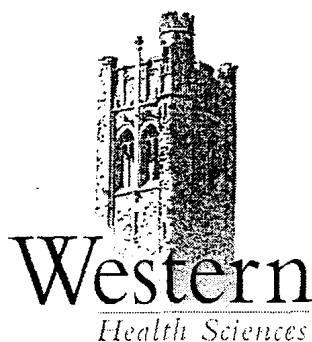
Falls are generally not the result of a single factor but rather a combination of both internal and external factors. Assessing the home is one method to reduce some detrimental external factors. Approaches can be done room by room or by elements (eg, lighting, clutter, spills). When recommending changes, cost and desire to change are the two factors to consider.

### Inside

Moving furniture is generally not recommended unless it poses a definite fall-risk hazard. Do not recommend that older adults rearrange things unless absolutely necessary. Example of recommendations for indoors follows: General considerations include using night-lights, keeping a flashlight by the bed, and using a cellular phone. Flooring: avoid shiny floors having the appearance of being wet because they can cause slips. Try to make these potential hazards stand out in some obvious way. Throw Rugs: eliminate the use of throw rugs, if possible. Bathroom: ensure that the necessary functional aids are available to allow safety in getting on and off the toilet and in and out of the tub or shower. This includes safety while in the tub or shower. Clutter: get rid of as much extraneous clutter on the floors and in pathways as possible, including extension cords, stacks of papers and magazines, and boxes.

Always remember: Falls are preventable

## Appendix G: Recruitment poster



**Have you fallen recently?**  
**Would you like to know more about your fall risk, and how you can prevent future falls?**

**Call us to join a health and aging study!**

**You must be 70 years or older and live in the community.**

## Denise Connelly at UWO

Denise Connelly at UWO

Denise Connelly at UWO

Denise Connelly at UWO

Denise Connelly at UWO

Denise Connelly at UW O

Denise Connelly at UWO

Denise Connelly at UWO

Appendix H: Telephone Mini-Mental State Exam (T-MMSE)

**MINI-MENTAL STATE EXAMINATION (Telephone Version)**  
**Data Sheet**

---

Subject ID: \_\_\_\_\_ Date: \_\_\_\_\_  
 Hospital: \_\_\_\_\_

**Orientation**

What is the:

1. year \_\_\_\_\_
2. season \_\_\_\_\_
3. date \_\_\_\_\_ /5
4. day of the week \_\_\_\_\_
5. month \_\_\_\_\_

Where are we?

1. country \_\_\_\_\_
2. province \_\_\_\_\_
3. city \_\_\_\_\_ /4
4. building \_\_\_\_\_

**Registration**

Name 3 objects: LEMON, KEY, BALL. Take one second to say each word.  
 Then ask the subject to repeat the three words. \_\_\_\_\_/3  
 Repeat exercise until he learns all three. Number of trials: \_\_\_\_\_

**Attention and Calculation**

Begin at 100 and count backward by 7. Stop after 5 subtractions.  
 OR  
 Ask subject to spell WORLD backwards.  
 Give one point for each correct letter in the right order. \_\_\_\_\_/5

**Recall**

Ask the subject to repeat the 3 objects previously mentioned: LEMON, KEY, and BALL. Give one point for each correct response. \_\_\_\_\_/3

**Language**

Repeat this phrase "No ifs, ands or buts". \_\_\_\_\_/1

Name one item: telephone.  
 "Tell me, what is the thing called that you are speaking into as you talk to me?" \_\_\_\_\_/1

Total \_\_\_\_\_

*Appendix I: Health Questionnaire***HEALTH QUESTIONNAIRE**

Date: \_\_\_\_\_

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Home Phone Number: \_\_\_\_\_

Sex: Man ☐ Woman ☐

Date of Birth: \_\_\_\_\_

Age: \_\_\_\_\_

Whom to contact in case of emergency:

Phone number: \_\_\_\_\_

Have you ever been diagnosed as having any of the following conditions?

Health Condition	Yes	No	Stable* Y/N
Heart Attack			
Angina (chest pain)			
Stroke			
Heart Surgery			
High Blood Pressure			
High Cholesterol			
Diabetes			
Respiratory Disease (specify _____)			
Osteoporosis			
Joint Replacement (site _____)			
Parkinson's Disease			
Multiple Sclerosis			
Epilepsy or seizures			
Arthritis			
Visual or depth perception problems			
Depression			
Vertigo			
Other health concerns (_____)			

\*Stable indicates no changes in medications within the past 6 months



Have you required emergency medical care or hospitalization in the last year?

Yes \_\_\_ No \_\_\_

If yes, please describe condition.

---

---

---

How would you describe your health compared to others your own age?

Excellent \_\_\_ Very Good \_\_\_ Good \_\_\_ Fair \_\_\_ Poor \_\_\_

Have you ever had any condition or suffered any injury that has affected your balance or ability to walk without assistance?

No \_\_\_ Yes \_\_\_

If yes, please list when this occurred and briefly explain the condition or injury.

---

---

---

### *Appendix J: Interview guides*

#### INTERVIEW #1.

1. Tell me about the day you fell
2. Can you tell me about any bumps or bruises from the fall
  - Probes:
    - Tell me about how you felt
    - Tell me about who was around when you fell and what they did or said about the fall.
3. Describe what happened after the fall
4. Tell me about anything that has changed since the fall
  - Probes:
    - Tell me how you do \*insert what they were doing when they fell\* now
    - Tell me about what you think about since the fall.
    - Which other parts of your home could cause you a fall? How much do you believe that? Why do you think that? Tell me how you know that?
5. Do you know other people your age who have fallen? What was their experience like? How do you feel you compare to them?
6. Tell me about the next time you fall
  - Tell me what you mean by that
  - I think I know what you mean but could you explain it more
  - I have an idea what you are talking about but
  - When/how much do you use modification?

#### INTERVIEW #2

1. Tell me about what this fall risk score means to you
2. Tell me about what you will do now that you know how you fair compared to others your own age
3. Describe what you have learned by participating in this study
4. Tell me about what the pictures mean to you and the way you think about falls
5. Tell me about what you've done with the suggestions for modifications
6. How do you feel about falling in your home and does it affect where you live?
7. What would falling more mean to you? What are your thoughts about how you may deal with falling in the future?
8. Tell me about what part of the study was not useful to you

*Appendix K: Examples of transcripts, field notes, and memos*

**SY – 1<sup>st</sup> Interview – August 13, 2008**

KG: Okay so it's August 13<sup>th</sup> at 2:26. Can you tell me in detail about the day you feel.

SY: Oh that day, well we unloading a lot of stuff in the apartment and one of the boxes that contained mom's jewellery was put beside the dining room table and I knew it was there but when I got up from the chair, I had forgotten where it was because it was there as a regular, you know, habit. So I tripped over it. I went down and I hit pretty hard but I got up and didn't seem to be hurt anywhere so just went on about my business. My sister picked up the box and she put it back under the dining room table where it have been in the first place but (...) what can I say.

KG: So this happened here?

SY: Yes.

KG: Did you get any sort of injury, bumps, bruises from the fall?

SY: Not from this fall, no, but I have fallen before and fell so hard that I shattered my pelvis. It was just like a cracked eggshell after you've boiled the egg and there were so many breaks that they quickly stopped counting at 100. Like it was just unbelievable how it shattered and that's what the doctor's terminology was that it has just shattered. But you see, the hard thing is, I'm at the age where I'm always playing catch-up with learning things like if had of been 10 years sooner, like my sister, she has all the advantage of knowledge of what the baby-boomer's are learning about the hazards of falls and the hazards of weak bones and the hazards of osteoporosis.

KG: So you're thinking you don't have that knowledge available to you right now?

SY: No, we do not have it. As soon as something is announced on the television I will go six months before I hear of any doctor or anybody talking to me about this new stuff that they've learned and how it's going to impact on my life, you know. Like, for instance, osteoporosis, now once again I'm the guinea pig and I have to suffer because the stupid, and that's all I can call her, is stupid, I'm awfully vain, but anyway rehab ( ) that's all I can put in pulled my finger off to the side out of alignment. Now I looked on the television last night and you know that actor that was in that horrific crash, where he flipped the jeep right over and he wrecked his hand, his hand was done the way mine should have been done, you see, like he has all three fingers taped together on a splint which is what I should have had but instead she taped two fingers together and the splint from the other finger pulled this finger, little finger, out of alignment and that's how my life, and that's how a lot of seniors see their lives as being compromised because we don't get good information fast enough. Physical therapists, not to name the girl, physical therapist. [laugh]. But anyway, if I had seen that guy on television six months ago I would have known that when she taped only two fingers together that that wasn't right. Because I learn information off the TV and I incorporate it into my life as quickly as possible.

KG: Yeah.

SY: Okay? As soon as I saw his three fingers and because he's an actor so he gets the crème de la crème and uh but his fingers were done just perfectly and on a splint which I should have had, you know, so that my fingers wouldn't spasm like they're doing now [laugh], you know. It's really frustrating.

KG: Oh yeah.

SY: It really is hurtful and by the same token I need my jaw operated on and they've left it during the summer and since January I haven't been able to get into the operating room and this guy on television he had three days he's not had his teeth [laugh] but that is in Toronto. He walked out in the middle of the

night without his teeth. He said I'm starving to death because I haven't got my teeth, I thought if he knew me and I'm the one that's starving to death, not him, but there's no way to get somebody to open up the operating rooms over the summer and there should be a way. They shouldn't just mandatory close down all the operating rooms for elective surgery and that's what they do and they just say to the seniors "too bad, so sad, see you in the fall".

KG: Do you think it's only seniors that they would apply that to?

SY: Yep, because I haven't (phone rang) ...

KG: You were talking about surgical rooms closing in the summer.

SY: Yeah, I haven't seen any children, I haven't seen any of the age from 30-40 that are waiting for operating time because they're all taken care of beforehand.

KG: So do you think you're being neglected sort of?

SY: Yep, that's exactly what it feels like. And the same way with the surgeon and my wrist. I had never had a surgeon tell me, it's alright, stay on the painkillers, you know, we're not going to operate on your wrist but we know the pain is pretty bad so you can stay on your painkillers, it's no big deal. I've never, ever heard a surgeon say that and for the first time I had to take a look at myself, what's wrong with this picture? You're old.

KG: How did that make you feel?

SY: I was devastated and a lot of time I go into depression and then I have to pull myself out of it and say, well, all things point that, which I better give them the benefit of the doubt, could you get me that bottle of water please?

KG: Sure.

SY: Thank you dear. Like I've even gone through the stress test. I went through everything to say I was okay for an operation. I had my heart checked out, I had my blood checked, I had my breathing checked and everything said I was a fine candidate for an operation so why are now the doctors saying it's okay for you to stay on pain medication, we're not going to operate, we know that you're in immense pain but just take pain medication for the rest of your life. My mom lived to 92, I probably will live to 102 given the rate that I'm going. I often wish the stork had taken me, yeah, because to live like this and feel so uncomfortable and so dependent on other people for everything. The only thing I can do is go to the bathroom by myself but everything else I need help with and all because the stupid doctors won't operate.

KG: Your stroke and with your hand, this has affected your balance.

SY: I wouldn't say the stroke has, probably it has indirectly but my hand definitely throws me off balance.

KG: Can you describe that for me?

SY: Yes, with my hand, I sort of try and hold it in a position that gives me the least amount of pain but often times in that position where I hold it, it will go into a spasm, the whole length of my arm so the spasm goes from my wrist, from my hand actually, because you can see how it's spasming and it goes right up to my shoulder. Now, if I had the wrist even operated on and I had the surgeon stand there and twice telling me that there was no such operation and yet I come home to the computer and all I do is type in wrist and there's the operation, exactly what I need and they're doing it and they have been doing it in the States for 10 years but they're not doing it in Canada. Why not? You know. We're supposed to be at the top and the best doctors and the best training and I live in a city where doctors and investigators and all kinds of medical people, why they can't do this operation on me, I do not understand and nobody can give me a

good reason. But when I hold my hand and my wrist in a certain position to try and alleviate the pain, that's when it goes into a spasm and that throws me off balance because you can't predict the spasm. You never know when it's gonna hit, you know. It just comes.

KG: Okay, I'm going to go back to the day you fell.

SY: Yes.

KG: Who was around?

SY: My sister.

KG: Just your sister? And what did they say or do about the fall?

SY: They moved a box [laugh].

KG: Were you concerned at all when you fell?

SY: Not afterwards because I saw my sister did something about it right off the bat and that's the way everybody should be at is alleviate the possibility of falling or being distracted. That's the other thing that makes us fall is we're distracted by something and then we fall. I don't know why but they'll be something, well that crack of thunder? I bet if I had been standing up I would have tripped if I had been walking because that loud crash, you know, that was pretty loud and you couldn't really predict it. Well it's the same with falling. You know, there are so many things. Like I don't understand why this apartment doesn't have hand rails. They have them up and down the hall but there's nothing, not even in the kitchen area for you to grab. There's just nothing so that makes it pretty cumbersome.

KG: So, do you know anyone else around your age, maybe a little bit older who has fallen?

SY: No. No, I don't know that many around my age. I'm the (youngest) in this building [laugh] and most of my girlfriends have either moved away or gone away or whatever and uh I don't have that many. I've just taken a year to recover from my mom and her passing and I haven't really wanted to get out and meet anybody until I get my jaw fixed.

KG: Okay.

SY: You know, I used to have teeth like you, for God's sake and then the combination of gum disease and that's another thing they don't tell you about that as you get older, your gum disease will get worse and there's nothing on the market to help it get better and so they just said well I walked into a door, a sliding glass door and broke off my teeth and so by the time I got to the dental surgeon they were so infected that they had to pull them all out. Now in order to put in the retainers for my other teeth they've got to first operate on my jaw and smooth off all the extra bony growths so I'm waiting for that, starving and waiting for that. Well I have a yogurt, a big thing of yogurt and a banana and a muffin twice a day, that's all I can eat. I don't get anything else.

KG: How long did they say again?

SY: Maybe in the fall but my doctor's nurse who just called she said you better call them so that didn't give me any reassurance at all let me tell you.

KG: How do you think your health compares to other peoples?

SY: Oh, mine is pretty good, yeah. I'm lucky and I can say that truthfully because I just had my physical and all my blood work and the doctors pried and poked and did everything and he sat back and he said well Suzanne I'm really quite amazed, you're in pretty good shape, you know, you're just fine, I can't find a thing wrong with you that I have to fix with medication or with physiotherapy or with anything.

You're fine. So I went out feeling quite good and then the stupid surgeon says well I'm not really going to waste my time on you because you're older and I don't understand this way of thinking, you know, like to just write me off because I'm older.

KG: How do you think the fall or any previous falls affected your health?

SY: Well when I shattered my pelvis, it made the one leg shorter which means if I don't have my shoes on, I'm liable to lose my balance even easier but I know that now, I've learned that and I know that I have somebody to go to who will fix my shoes for a reasonable price. So far he hasn't charged me because I'm in his study group [laugh] and he likes to have people on hand in his study group [laugh]. I think he's going into teaching and that's when he'll make good use of me [laugh].

KG: You just have to wait for that huh? [laugh].

SY: Yeah, yeah, but I've signed the waivers and I said I'd be ready because I was afraid to ask how much because it's all gotta be hand done, you know, so but then I asked.

KG: So you were saying that the box was an object that isn't normally there which is why you got distracted.

SY: Yeah.

KG: What about the other parts of your home, do you know any parts of the home that could cause you to fall?

SY: Good question, I'd have to think on that for a bit. I have to be very careful in the bedroom that nobody moves stuff out of place because I sort of have my route to my bed and that's after I've turned off all the lights. Although since my fall, I must admit, I leave my bedroom light on all the time so I don't walk in in the dark so that's one change I have made.

KG: Okay.

SY: And that I have to be aware of.

KG: So do you do that every night?

SY: Yep. Yeah because if at night you don't do it, you're fall and break your jaw or something [laugh]. What can I say, I'm very careful at my door front, I don't know why they don't have a rug there of some kind or even to put down those stripes, you know? Because if it gets wet in the winter you just slide around like you're on ice and I often don't put my boots on until I go out into the hall. I just don't want to take the risk anymore. Like the one bad fall where I shattered my pelvis, it didn't really sink in to the degree of hurt that I suffered but now I see what it did to me and how you can't go back and fix that, you know.

KG: How do you feel about that?

SY: It was just so devastating and to such a degree and it just took me back, you know, so I'm very careful now because I shouldn't have tripped over that box. It wasn't in that bad a place that I should have tripped over it but now I'm very cautious and, I have to admit, when the girls come in to help me with supper and that I always look around afterwards to make sure they haven't moved something because even an inch or two is enough to trip you if it's out of place so you try and be as careful as you can that's all you can do.

KG: You're taking some precautions and you seem pretty aware. Do you believe you can fall again?

SY: Oh yeah, yeah, we can't turn it off at our age because we can't get better like you young ( ). [laugh]. For some reason we don't heal right like because of my major fall where I really did hurt myself it didn't heal right at all and yet nobody watched the healing even though it took almost three years for it to heal properly. It never healed properly. When the doctor went to do the cervical cancer check, he couldn't get the thing in, the speculum in and he kept saying, what's the matter Suzanne, what's the matter? Never have you had this trouble before. And I'm saying never, never, ouch and here when my hip had healed on the one side where it's shoulder, the whole hip had come down like this so one hip is like this and the other hip is like that. Nice eh? And yet nobody ever told me with the x-rays. They took the x-rays, yet the x-ray technicians can't tell you anything and by the time you get back to your doctor, who remembers to ask about an x-ray three months ago. You expect your doctor to do it but he's got 3000 patients.

KG: Wow.

SY: 3000, you know and he can't, there's no way he can keep track of every lab test and every blood work, there's just no way. And the same with my brother, the only reason why he's being treated for cancer today was because his daughter who's in her last year of being a chiropractor, learning to be a chiropractor saw his blood test on the table and she went, dad, you gotta get to your doctor right away. This blood test, there's something really wrong with it so when he went to his doctor and had his doctor check it, that was on the Tuesday, by Thursday he was seeing a cancer specialist and by Friday he was seeing, having all his dates set up for chemotherapy and getting all the bulls eyes put on his body which I didn't know anything about but when they line you up for radiation, they tattoo the bulls eyes right on your body so they hit the same place each time and yet the doctor who I imagine is just like my doctor has 3000 patients that he's gotta take care of and he missed my brother's blood tests and it was his daughter who saved him, maybe. You don't know how fast the cancer's growing. We try and think positive.

KG: Hopefully.

SY: Yeah, hopefully.

KG: So you said before that you look, you research things on the Internet and you bring them to your doctors.

SY: Yep.

KG: Have you researched anything about falls or falling?

SY: Nope.

KG: No?

SY: No, it's just I never thought to be honest with you. I wouldn't know what to address it under like with the wrist you just type in wrist and it goes immediately. The first thing that came up was this, this one for your finger and I don't know where I'd type in falling.

KG: You could probably type in just falls.

SY: I'll do that tonight and let you know.

KG: Do you feel that that could be a big part of getting older?

SY: Yep, absolutely.

KG: Do you think it'll affect your health?

SY: Yep, it'll affect everything. How you see the world and, you know, how scared you are about going into a strange place. I know that even going into my brother's house I'm very aware of where

everything is and whether they have animals, cats in particular. Cats can trip you. They can trip you just as easy as a dog, and I'm surprised at the number of cats that are in this place. I know that they're good companions but I also know from my mother's experience that they love to wrap around your legs and that would trip me up without a doubt. So I'm always asking if there's a cat in new place where I go. Oh yeah.

KG: Well that's good, you're very aware.

SY: Yeah. Because of my mother I always remember the cat used to wind it's body around her ankles and that will trip you.

KG: So you've learned from a previous example.

SY: Yep, and that's why I use the TV so much because you can learn so much at a high rate of speed whereas if you wait for your doctor or the senior's center, like we had break-ins last summer and it took forever for them to get the police out here to teach people not to leave their apartment doors unlocked because someone will just walk in. They had reached the fourth floor by the time the police had come, yep. And I was on fifth thinking oh my god, I don't want them to get up to my apartment. It was scary.

KG: So do you feel you learn a lot from TV and the Internet that you could apply to your situation?

SY: Yep, but they don't cover falls. I haven't seen one program on falling and that's the truth. They usually have segments through the day for seniors but I've never seen one on falling. Maybe you should take care of that. You just need a 15 second ( ) and we'd get all kinds of inquiries about it. Just something as a dropping off point. All we need is a phone number or a computer address and then we'd go to it but until you mentioned it, I never thought of falls on the computer. I would have eventually got there but I hadn't. Now with me it was first hand experience and I think that's the biggest affect that it has on baby boomers is we're the ones to experience it and do something about it whereas generations before I remember with my mom, she never talked to me about falling and yet as a nurse, she taught me everything, you know, about growing older and during her last five years of living, she would give me hints about this, that and the other thing, but never about falling.

KG: Did your mother ever fall?

SY: Yeah, yeah she, yeah she had a couple of really, but hers were more from her false knees, her artificial knees and never even thought to apply them to me because I don't have artificial knees whereas my brother does. He had both his knees done at the same time. But had had been a teacher for 27 years so they said that they would do one at a time and he said no way, you're doing both of them. In hindsight now he realizes now that was the wrong thing to do that he should have had one done and then the other done.

KG: When you fell and shattered your pelvis, did they give you any sort of information on falls?

SY: No, nothing. They didn't even ask me about, you know, how it happened or what had led up to it. Nobody was really interested, they just kept looking at the x-rays saying "wow", "holy cow", "how did she manage this". But it never came back to me but I heard their explanations. They were really blown away by the x-rays. Oh god, it was a bad time in my life, let me tell you. My doctor said you're sure you're not going to have any children now are you? I said no chance and I said you're never doing the cancer test again either. You're not shoving that thing in.

KG: I just want to go back to because I'm not too sure again. When you said you tripped over the box, what were your immediate thoughts after?

SY: Oh you stupid fool [laugh]. That's how you always feel after you fall, as if somebody has tricked you or played a joke on you. You never think that you're the reason yourself for doing it and that's what I find really strange.

KG: Did you think you were the reason?



SY: No, I just thought darn, somebody has done something to me again. Why wasn't I more careful? Well I was prepared not to get up. I was very scared to get up with the history of my pelvis and I had to get up very carefully, you know, to make sure I hadn't unhinged something or busted something else but no I was just mad at myself for not realizing that the box was really in the way of my normal pattern and I didn't realize that and I think that's where a lot of the seniors, you know, are dependent on their memory for stuff because after that I know I was aware of everything is to a bigger extent than where I did previously because nothing is worse than falling, it just ( ) for a loop and nobody ever says anything to you afterwards, oh you poor dear, that really must have knocked the wind out of you or come lie down, put your feet up, I'll get you a hot cup of tea or something. They just expect you to continue on and that is a mistake with falls because it sometimes takes you 24 to 36 hours before you realize you've hurt yourself and that's a problem, you know. Often times you will have hurt yourself and not know until later and then you have this pain and you don't connect it to the fall. Do you know what I mean? Yeah.

KG: And you said too that when you go somewhere, you always ask if there's cats or your more aware. So do you think you're?

SY: After the box I didn't get hurt. On the other falls previous to that I either cut myself open or I've had goose eggs or stuff like that where you've immediately connected with the fall but I've had other falls where I have hurt myself but it wasn't until long afterwards that I connected the fall with the hurt but this time when I did the hurt myself and I got up and I brushed myself off and I thought, boy I'm lucky, I could have really done myself in on this fall but I really started to realize. Isn't that stupid? Oh god, you know but everything changes so much between 55 and 60. Like they were saying today on television that the new 60 is 40, I don't think so. They might be able to fool themselves for a while, Madonna and her facelifts and whatever but soon after 62, 63, you cannot keep it ( ) It's just like a ( ) of having to know so much about yourself almost being like an Olympian, a champion, knowing every little twist and turn about your body that you have to be aware of what impacts it and why. Like if you don't take in a certain number of calories you spend long, long hours in the bathroom. You don't want to but you will have no choice and then you'll say oh yeah, I didn't have enough bran muffins or I didn't drink enough fluid and I'm paying for it now and I won't ever, ever, ever do it again. Please. Yeah, because nobody tells you that as you get older you're calories and your bulk and your fluids have to be consistent. If they aren't consistent, you're going to pay for it no matter what kind of a champion you are, you know? I've never had problems before and I never used to have to think about how much I ate each day but now it's almost like a religion [laugh]. You just have to know what you're doing.

KG: So is there anything else you want to tell me about?

SY: No, it's just the awareness. I think your program is really, really important. But I don't know now to boost it to the forefront and get people to listen to you because I'm a prime example, shattered my pelvis, no, that didn't teach me, walking through the glass door, broke off my teeth, no, that didn't teach me but yet falling down and having no repercussions from the fall and then seeing my sister just move the box under the table, out of my pathway, that did it and seeing her actually do it I think was the connection, you know, when I walked through the glass door, my daughter had done something she never did before. She closed the door and that one time, it was just the time of day and I wanted to get that component where it's a time of day and the shadows and that. When I've fallen getting off the bus, you know, and I've been real bad and I've turned back and I said to the driver, isn't this a ( ) bus? And he says oh yeah but getting them to use it is the trick and you have to be aware, you have to say, have you let the ( ) down and make really sure because just that couple of inches and down I went, right in the mud. I didn't hurt myself but my self-esteem was hurt [laugh]. I scrambled up as fast I could.

KG: Well thank you for taking your time and talking with me.

SY: Well I hope I've done something to help with what you're doing because I think it's really important although we may not realize it yet because there's so many other things that are at the forefront already but if you fall and you hurt your wrist, like you see I didn't fall and hurt my wrist but I'm sure that's what's putting me off balance, I'm almost positive because my balance has been so erratic or

stiffening up on this side but this side is moving so if you put this foot forward it sort of is in spasms and it throws you off, you know. You don't have that relaxed state about you.

KG: Well thank you again.

SY: Well I hope it helps, even a little bit.

### **SRK – 1<sup>st</sup> Interview – Fieldnote & Memo**

She was very welcoming and open about sharing her experience, and continuously tries to explain to me that the fall was not a big deal and she's participating in the study because she feels it will help me finish up school or help someone else.

She is very insistent on showing me how she fell and it seems that she wants me to fully know, by demonstration as well, that the fall wasn't her "fault". She states multiple times that it was an accident due to not thinking.

She mentions she was "off my game" due to having an illness (shingles) and said they made her very tired and unable to do her normal everyday things i.e. gardening. I think she believes she fell due to her illness, and that this study isn't really for her and her participation in it is more helpful to me than herself.

SRK laughs a lot when talking about something serious – it seems like a deflection technique on her part – should have asked more about this. She thinks of herself as a generally happy person, which also comes off as she is trying very hard to maintain this persona.

She is very insistent on being healthy, and that her age won't limit her activities. She then begins to list her activities for me – it's almost like she knows there are individuals her age that don't do as much as she does and that perhaps I should recognize this or maybe she's trying to let me know this.

This leads to a comparison between herself and her sister. Her sister is older than her and she's very active. SRK thinks her sister is more active than she is and seems to find this unbelievable. It's almost a competition to SRK to see which one of them can remain the healthiest longer. This can be positive in the sense that SRK seems to push herself to maintain her health and keep active, but she ignores certain warning signals, i.e. her high blood pressure.

SRK also compares herself to her husband. She believes she's more active and stronger than he is. She states "he doesn't listen to me, but I don't know what he'd do without me".

SRK seems to be a very confident, take-charge woman and having this fall AND having the fall be part of a study seems to knock down her self confidence. It appears that for SRK a fall is a fall no matter what age, but having someone like me come to her home, with all kinds of fall information and surveys makes her realize that falling at an older age means she's getting old. I feel that this made her uncomfortable, and she preferred not to discuss the fall and spend more time on how healthy she is.

Her thoughts on falling: "get up, get over it, and move on". She was taught this at a young age and feels it should still apply, no matter what age a person is. She believes that age should not limit her activities and what she does in her daily life.

SRK was very interested in the balance testing. She feels this is another way she can improve on her health to keep her going a longer time. She feels the more she can learn about preventing falls the better. Before I leave SRK's house she mentions that she is too fit and healthy for a retirement or nursing home. She thinks it would be ideal to live and die at her home; she realizes that she isn't as young as she used to be but if she can avoid any kind of institution she will.

SRK strikes me as a confident and very independent woman that won't let anything stop her.

I think having this fall shook her up but I don't think it was enough to encourage a change in how she goes about her daily activities. She believes it was an avoidable and preventable accident and her own stupidity brought it on. I think she's angry the fall happened and more than likely will not mention another fall she has if there were no injuries involved.

I don't believe SRK thought much about this fall, however she is a learner and likes to incorporate new and positive things in her life, so maybe the home prevention list might be useful to her, or even what she may learn at the educational session.

*Appendix L: Example of NVivo Codes*

**Free Nodes**

Name	Sources
Access to information	2
Activity	5
Age-Related concerns	8
Alone at the time of fall	3
Angry at possibility of fut	1
Annoyance at self	2
Attitude on falling	7
Awareness	10
Balance	7
Balance score gave mor	2
Balance Testing Useful	2
Behaviour change	4
Baker scale	1
Booklet had good things	1
Booklet not useful	1
Booklet Useful	3
bumped head	1
Burden	1
Careful	1
Cautious	9
Changes since the fall	10
Cleaning	2
Common Sense	1
Companion to others	8
Concentration	1
Concerned about fall	3
Confidence	1
Confident in aging	1
Confident in not falling	1
Cope	1
couldn't do anything	1
couldn't get up	1
Detection of the fall	1
Dependent on others	1
Depression	2
dishes	1
dizzy	1
Don't want to fall	1
Embarrassed	2
Exercise	5
Expectations after the fal	2
Extra precautions	8