



Factors Associated with Fear of Falling in Community-Dwelling Older Adults in Regional New South Wales

Peter Sirr

BPhysio, PostGradGerontology, MGerontology

Grade 3 Physiotherapist

Mercy Health Albury

E: psirr@mercy.com.au

Ph: (02) 6042 1439



HETI
HEALTH EDUCATION &
TRAINING INSTITUTE



Mercy Health
Care first



Health
Murrumbidgee
Local Health District

Acknowledgements

This project was supported through the NSW Health Education and Training Institute (HETI) through the Rural Research Capacity Building Program.

The author expresses his gratitude and sincere appreciation to the following people who have been instrumental throughout this project:

David Schmidt and Kerith Duncanson, Rural Research Capacity Building Program Officers, Health Education and Training Institute (HETI) – for all of their ongoing support, encouragement and advice, allowing me to complete this research project.

Professor Cathie Sherrington, Professorial Research Fellow, University of Sydney; Head of the Ageing and Physical Disability Program, The George Institute for Global Health – your knowledge, support, advice and assistance throughout this project has been invaluable!

Mercy Health Albury, especially Jacinta Finn (Allied Health Team Leader) and Christine Arnold (Executive Director) for supporting my participation in the Rural Research Capacity Building Program.

Murrumbidgee Local Health District – for their support of my research project and for their ongoing support of the Rural Research Capacity Building Program.

Allied Health Staff, Mercy Health Albury– 550 Poole Street, Albury, NSW 2640 – for their collegial support and assistance with the data collection and assisting with backfill of my position.

Abbreviations:

- **DASS21:** Depression, Anxiety and Stress Scale
- **FES-I:** Falls Efficacy Scale-International shortened version
- **FOF:** Fear of falling
- **FRAT:** Falls Risk Assessment Tool
- **HREC:** Human Research Ethics Committee
- **MSPSS:** Multidimensional Scale of Perceived Social Support
- **TUGT:** Timed up and Go Test

Table of Contents

Acknowledgements.....	2
Abbreviations.....	2
Abstract.....	4
Executive Summary.....	5
Introduction.....	7
Background.....	8
Research Question.....	10
Objectives.....	10
Methods.....	11
Results.....	14
Discussion.....	18
Strengths.....	21
Limitations.....	21
Recommendations.....	22
Conclusion.....	23
References.....	24
Appendices.....	27

Abstract

Introduction

Fear of falling (FOF) affects up to 85% of community-dwelling individuals aged 65 years or older and can lead to curtailment of activities, reduced mobility and an increased falls risk. The factors associated with FOF have not been explored within Australia.

Method

A cross-sectional study was undertaken with 136 community-dwelling people aged 65 years and older who were attending individual and group physiotherapy programs. Factors associated with FOF, measured by the Falls Efficacy Scale (FES-I), were identified using a series of univariate linear regression analyses. Those variables with an association, defined as a $p < 0.1$, were included in a final multivariate linear regression model.

Results

Participants had a mean age of 80.5 (SD 6.7) years and 102 (75%) participants were female. High FOF was reported by 79 participants (58%). Univariate analysis indicated variables associated with FOF included age, gender, a history of a fracture from a fall, any previous falls, depression,

anxiety, stress, Falls Risk Assessment Tool (FRAT) score, Timed Up and Go Test (TUGT) time, falls in the past 12 months, and a higher number of prescribed medications. Multivariate linear regression analysis defined a model including falls in the past 12 months ($p < 0.01$), number of prescribed medications ($p < 0.05$), stress score ($p < 0.001$) and TUGT time ($p < 0.01$). Together these variables explained 29% of the variability in FOF.

Conclusion

This study is the first of its kind to explore factors associated with FOF in an Australian setting. Factors found to be independently associated with FOF included stress, mobility performance, medications and recent falls history.

Implications

This study informs clinical practice by enabling the identification of people who experience FOF. The results indicate that there are several interventions worthy of inclusion within falls prevention programs. For those who have recently fallen, therapists should consider implementing interventions that target stress and pharmaceutical management as well as exercises targeting functional mobility and rapid position changes.

Keywords:

Fall, falling, fear of falling, factors, community

Executive Summary

Implications

- Fear of falling is highly prevalent and is an important factor that needs to be considered and measured within falls prevention programs. Falls programs need to incorporate a biopsychosocial approach to building falls-related self-efficacy.
- This study informs clinical practice by informing clinicians of factors associated with fear of falling, highlighting that factors associated with fear of falling include higher stress levels, more prescribed medications, reduced mobility performance and a recent history of falls.
- Clinicians and researchers need to consider within falls prevention programs, interventions that target stress management and reduce prescribed medications, particularly for those with a recent history of falls.
- Exercises focussed on rapid position changes and functional mobility should be considered for those with a fear of falling.

Background

Falls and fear of falling are interrelated, with fear of falling shown to be strongly predictive of falls. Fear of falling has a reported prevalence of between 21% and 85% among community-dwelling older adults who have previously fallen and 33 to 46% in older adults who have not fallen. Studies have found that two out of three older people with fear of falling will fall each year. Fear of falling has been shown to have long term negative physical and psychosocial consequences including activity limitation, social isolation, decreased independence, poorer mental health, depression and reduced quality of life. Fear of falling can cause activity curtailment, leading to reduced mobility and physical fitness, and increasing the risk of falling. Research shows that fear of falling increases health care costs and increases use of health resources, independent of whether a person has a falls history. Notably however, within Australia, no studies have been performed that highlight the factors that are associated with fear of falling.

The study

A cross sectional design was utilised, with data collected from 136 community-dwelling older adults. The participants were all clients of allied health staff at Mercy Health Albury. Exclusion criteria were clients who were not cognitively able to complete the data collation form and those who were unable to walk 100 metres. Data was obtained from each participant through a questionnaire and assessments that captured demographic data, medical details, falls history, falls screening, fear of falling, perceived social supports in place, physical function and functional mobility through the timed up and go test (TUGT), depression, anxiety, and stress measures. The data were collated and analysed using the statistical analysis software Stata (version 13.1). Descriptive statistics were obtained from the data. Univariate and multiple linear regression analyses were utilised to determine factors associated with fear of falling, as measured by the Falls Efficacy Scale International shortened version (FES-I).

Results

The mean age of the participants was 80.5 (SD \pm 6.7) years with 75% of participants being female. The majority (85%) of the participants had a history of falls, with 46% of all participants falling within the last 12 months. More than half (60%) of the participants used a walking aid. High fear of falling (score \geq 11 on FES-I) was reported by 58% of participants. Univariate analysis indicated variables associated with fear of falling included age ($p=0.096$), gender ($p=0.066$), a history of a fracture from a fall ($p<0.05$), previous falls ($p<0.01$), anxiety ($p<0.01$), stress ($p<0.001$), FRAT score ($p<0.001$), TUGT time ($p<0.001$), depression ($p<0.001$), falls in the past 12 months ($p<0.001$), and medications ($p<0.001$). Multivariate linear regression was utilised for the factors with a $p<0.1$ and defined a model that included four factors associated with fear of falling as falls in the past 12 months ($p<0.001$), medications ($p<0.05$), stress score ($p<0.001$), and TUGT time results ($p<0.01$). This model was found to be statistically significant in accounting for the variability in fear of falling and explained 29% of the variability in fear of falling.

Conclusion

This study is the first of its kind to explore factors associated with fear of falling in an Australian setting and the findings reinforce the complexity of fear of falling. A model was defined and included four factors that were found to be significantly associated with fear of falling. These factors include increased stress, higher number of medications, slower TUGT time and a history of falls in the last 12 months.

Introduction

Creating an understanding of falls and delivering and evaluating interventions to prevent falls has been highlighted by NSW Health as a service priority area for 2012-2017 [1]. NSW data shows that 26% of people over the age of 65 have at least one fall every year [2]. Other Australian and international studies report that up to one in three community-dwelling individuals aged 65 years or older fall each year [3, 4]. Within NSW alone, there were 63,518 hospitalisations in the 2013-14 financial year due to falls, with this rate fifty percent higher than ten years ago [5, 6]. The healthcare cost attributed to falls in NSW in 2006/2007 was \$558.5 million [2]. It is acknowledged that the rates of fall-related hospitalisations and associated healthcare costs within NSW continue to rise, despite the wide range of interventions in place aimed to reduce falls [6, 7].

Fear of falling is a multi-dimensional concept which includes the perceived threat of falling, perceived risk of falling, concern about consequences of falls, and fall-related self-efficacy [8]. Fear of falling has been shown to increase health care costs and increases the use of health resources, independent of whether a person has a falls history [9]. Fear of falling has also been shown to lead to falls, independent of any physical, medical or balance impairment [10]. Falls rates for those with a fear of falling increase to two out of three falling each year [11], doubling the average rate of falls for people over the age of 65.

Fear of falling is a serious problem and the consequences of fear of falling are of concern to older people, caregivers, and health and social services [9, 12]. In addition to targeting factors associated with falls, fear of falling in itself needs to be specifically addressed [12]. Clinicians need to understand fear of falling, as this will allow provision of appropriate interventions to promote independence, function, wellness, and safety in older adults. This report describes a cross-sectional study undertaken to determine the factors associated with fear of falling in community-dwelling older adults.

Background

Fear of falling is an important consideration in health care [11, 13-15]. Fear of falling has a reported prevalence of between 21% and 85% among community-dwelling older adults who have previously fallen and 33-46% in older adults who have no falls history [16-18]. The prevalence of fear of falling has been shown to be higher in women and increases with age [16, 19].



Fear of falling can be more psychologically harmful than a fall itself [20]. Amongst older adults with no history of falls, those with fear of falling have an almost five-fold risk of nursing home admission compared to those without a fear of falling [12]. Fear of falling has also been shown to have long-term negative physical and psychosocial consequences including social isolation, decreased independence, poorer mental health, increased risk of depression and reduced quality of life [12, 16]. Additionally, fear of falling has been shown to result in activity curtailment [21], leading to reduced mobility and physical fitness [12], and an increased risk of falling and injury [18]. Hence, fear of falling is an important factor that needs to be considered and measured within falls prevention programs as a separate entity to previous falls and falls risk [22]. Due to the severe consequences of fear of falling, building falls-related self-efficacy is crucial and as important as falls prevention through physical training [23].

Fear of falling has been shown to have a significant impact on falls rates [14], however this impact is not fully understood. Research has shown that high fear of falling is related to less risk-taking behaviours [24] and behaviour adaptation [14], but leads to both higher [10] and lower falls rates [14]. Falls rates in community-dwelling older people in China were significantly lower than in a matched Australian cohort, which was attributed to Chinese participants having an increased fear of falling and having an associated behaviour adaptation to lessen their fall risk [14]. A recent Australian study supports these findings, stating that an independent factor for falls in community-dwelling Australians was risk-taking behaviour [24]. Contrastingly however, it has also been highlighted that despite Australian's with high fear of falling being less likely to exhibit risk-taking behaviours, they were more likely to fall [24]. This increased likelihood of falling, despite less risk taking, is thought to some extent being due to fear of falling leading to inappropriate restriction of activity, resulting in a reduction in activity and consequently lower physical ability [24]. This has also been highlighted in previous studies [21, 25].

The only research previously undertaken looking at factors associated with fear of falling have been performed outside of Australia and in metropolitan areas. The three major studies in this area were undertaken within London [13], Hong Kong [15] and Taiwan [26]. These studies highlighted a large range of factors associated with fear of falling. Factors contributing to community-dwelling people in London developing a fear of falling included education level, higher BMI, lower income, difficulty in using public transport, use of a walking aid, poorer perceived health, and self-reported balance and mobility problems [13]. Factors found to be associated with fear of falling in community dwelling older adults in Hong Kong included being female, suffering from poor vision and arthritis, poor performance in the timed up and go test, and depression and anxiety symptoms [15]. Falls in the last 12 months, quality of life, age, insomnia, depression and subjective health were all found to be associated with fear of falling in Taiwan [26].

There are differences in the biopsychosocial factors between the participants in the aforementioned studies and people in regional Australia. This is evidenced through the differences in falls rates, social support systems, and health care systems in these countries compared to Australia. Research highlights that many of the risk factors associated with fear of falling, such as socioeconomic status, perceived health, education level, public transport availability, depression and anxiety, are different in rural and regional areas in comparison to metropolitan areas [13, 15, 26, 27].

There is an abundance of research performed that highlights the importance of fear of falling and it's associated falls indication [11, 13-15]. Within many NSW Health and Australian developed falls prevention programs, fear of falling is not commonly assessed. Clinicians need to understand and assess fear of falling adequately, as this will allow provision of appropriate interventions to promote independence, function, wellness, and safety in older adults.

Fear of falling is a complex concept and is not well understood within the Australian context. To the author's knowledge, there has been no research undertaken looking at factors associated with fear of falling within Australia, or globally in non-metropolitan areas. It is vital that an understanding is gained regarding the factors associated with fear of falling in both Australia and in regional populations, as this will lead to the design, research and implementation of effective multidimensional interventions that target this fear.

Research Question

What are the factors associated with fear of falling in community-dwelling older people in regional NSW?

Primary Objective

To determine the factors associated with fear of falling in community-dwelling people aged 65 and over in regional NSW.

Secondary Objectives

1. To use the results of this study to provide recommendations for clinicians and researchers regarding development of interventions that target a reduction of a person's fear of falling.
2. To establish the prevalence of high fear of falling in community-dwelling adults aged 65 years and over within MLHD who attend community exercise programs.



Methods

Ethics

Ethical approval was granted by the Mercy Health Human Research Ethics Committee on the 6th of January 2016 (Approval number R15-51A). Due to the location of the research being undertaken, both the Albury Wodonga Health HREC and the Greater Western HREC were regularly informed of the progress of the study.

Design

A cross-sectional design was utilised, with 136 participants recruited to complete the research data forms, containing both questionnaires, self-reported assessment tools and a therapist assessment. To gain statistical power, a sample size calculation was conducted and a minimum sample of 135 was required to examine the expected 14 predictor variables with a statistical power of 80%, probability of 0.05 and effect size of 0.15.

Population

A convenience sampling method was utilised, with community-dwelling older people aged 65 and over recruited from Mercy Health Albury. Mercy Health Albury is a sub-acute public hospital that incorporates community allied health services, a Geriatric Evaluation and Management ward, a transitional care ward and inpatient and outpatient palliative care services. All clients that were recruited were current clientele of allied health staff from Mercy Health Albury.

Mercy Health Albury clients were invited to participate in the study by the principal investigator, either individually or as a group. Clients were eligible to participate if they were aged 65 and over, were community-dwelling and were current clients of an allied health service at Mercy Health Albury. The participant information sheet and consent form were given to potential participants during an explanation of the study. Potential participants were then given time to consider participation, and given the opportunity to not participate in the research if they desired. Non-participation did not affect the client's treatment or relationship with Mercy Health Albury's services. Potential participants were excluded if they had a dementia process or a cognitive impairment which rendered them unable to answer the questionnaires or were unable to follow directions required during testing. To allow safe completion of the physical measures, those that were unable to walk 100 metres independently with or without the use of a gait aid were excluded.

Data collection and handling

Participants were offered to complete the data collection form (see Appendix 1) either in a group setting or individually. The data collation form consisted of five sections, of which the first four were self-administered questionnaires and the fifth was completed by the principal investigator. To reduce the possibility of performance bias, during completion the first four sections, participants were asked to complete the data collation form by themselves and those in a group setting were offered multiple spaces where they could do this. Once participants had completed the first four sections, the principal investigator then completed the final section with the participant.

The first section contained demographic details including name, age, gender, marital status, household membership, use of a walking aid, education level, number of prescribed medications, and history of fall. The second section involved the participant completing the Shortened Falls Efficacy Scale-International (FES-I). The FES-I is a validated self-administered tool that measures fear of falling during activities inside and outside of the home [28]. Participant results in the FES-I can be categorised into low fear of falling ($\leq 10/28$) and high fear of falling ($\geq 11/28$) [28].

The third component involved the participant completing the Multidimensional Scale of Perceived Social Support (MSPSS). The MSPSS is a validated self-administered tool designed to measure the participant's perception of support from family, friends, and significant others [29]. Through participant completion of 12 questions, a score is given, with a higher score indicative of higher perceived social support.

The fourth component of the data collection form was the completion of the self-administered Depression, Anxiety and Stress Scale (DASS21) questionnaire. The DASS21 is a validated 21-item self-report questionnaire used to screen and measure the severity of symptoms in the three domains of depression, anxiety and stress [30]. Through completion, participants gain scores in each of the three domains.

The final component involved a therapist completing two other measures: The Timed Up and Go Test (TUGT) and the Falls Risk Assessment Tool (FRAT). The TUGT is a validated objective assessment performed to assess the participant's physical abilities, ability to cope with rapid positional changes and functional mobility [31, 32]. A TUGT time of ≥ 13.5 seconds is shown to predict falls in community-dwelling elders and community-dwelling people aged 80-89 years have a mean TUGT time of 10 seconds [31-33] The FRAT is a validated screening tool developed in Victoria to highlight an individual's falls-risk utilising purely subjective data [34].

All collected data were reviewed by the principal investigator and all data gaps were rectified by making contact with the participant and arranging for completion to occur. All data obtained were de-identified and collated into an excel spreadsheet, with coding utilised for categorical data.

Data analysis

Analysis was completed using the statistical software Stata 13.1. Descriptive statistics were used to illustrate the participant's baseline characteristics, both generally and within the two sub-groups of participants with high fear of falling and participants with low fear of falling. The FES-I results were defined into two categories, with participants with low fear of falling scoring 7-10 and participants with high fear of falling scoring ≥ 11 [28]. The FES-I score was analysed with the dataset noted to be skewed (Figure 1). Due to this, the natural logarithm of this variable was taken to allow the distribution of the data to be normalised (Figure 2).

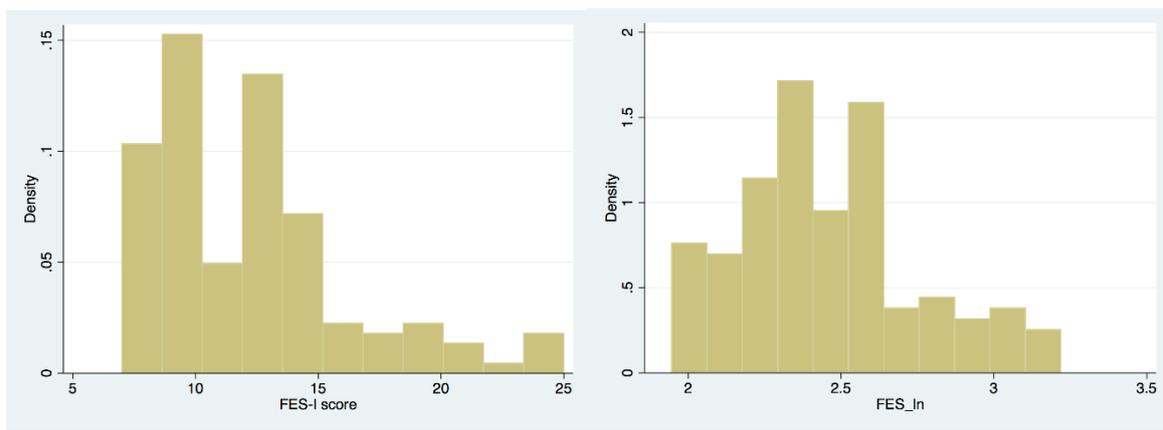


Figure 1: FES-I score

Figure 2: FES-I score (natural logarithm)

Univariate linear regression analysis was utilised to determine the relationship between the logged FES-I score and each variable. To allow univariate regression to occur, educational level was divided into “school level only” and “post-school qualification” groups and marital status was coded into “partner” and “no partner” groups. Univariate regression highlighted the coefficient of determination (R^2), which indicated the proportion of variance in fear of falling that is predictable from the independent variable.

For all variables that had a $p < 0.1$ association with fear of falling in the univariate analysis, a correlation co-efficient was utilised to identify any correlation between the independent or potential predictor variables. Where two variables were highly correlated, the variable with the least significant p-score in the univariate regression analyses were removed to avoid multicollinearity. Multivariate regression modelling was used utilising a stepwise approach to determine a model of variables that best explained fear of falling. Statistical significance within the multivariate regression was defined as $p < 0.05$; however, when selecting variables from the univariate regression analyses to be included in the multivariate regression model, a $p < 0.1$ inclusion criterion was defined.

Results

Demographic characteristics

Demographic characteristics and results of assessments are found in Table 1. The study sample consisted of 136 participants with a mean age (\pm SD) of 80.5 years (\pm 6.7), with 75% of participants being female.

Fifty-seven percent of participants lived alone and 43% lived with others, with a mean (\pm SD) household membership of 1.5 (\pm 0.5) people. Notably however, the mean MSPSS score (71.3 ± 12.8) indicates that participants felt that they were highly socially supported. The majority (70%) of participants had not completed any post-school education. Of the participants, 85% had fallen at some stage, with 46% of participants having fallen within the past year. Over half of the participants (60%) used a walking aid and 38% had experienced a previous fracture because of a fall. Participants took a mean of 7.1 (\pm 4.9) prescribed medications daily.

Table 1: Characteristics of all participants and participants categorised into high and low fear of falling.

Predictor Variable	All Participants (n=136)	High fear of falling (n=79)	Low fear of falling (n=57)
Age (mean \pm SD)	80.5 \pm 6.7	80.0 \pm 7.3	81.2 \pm 5.8
Gender female (n (%))	102 (75%)	65 (82%)	37 (65%)
Post-School Education (n (%))	41 (30%)	25 (32%)	16 (28%)
Household membership (mean \pm SD)	1.5 \pm 0.5	1.4 \pm 0.5	1.4 \pm 0.5
Medications (mean \pm SD)	7.1 \pm 4.9	7.9 \pm 5.1	6.0 \pm 3.7
MSPSS Score (mean \pm SD)	71.3 \pm 12.8	70.2 \pm 12.5	73.0 \pm 13.1
Depression Score (mean \pm SD)	8.1 \pm 7.3	9.8 \pm 8.5	5.8 \pm 4.5
Anxiety Score (mean \pm SD)	8.7 \pm 7.1	9.5 \pm 7.1	7.7 \pm 7.1
Stress Score (mean \pm SD)	9.9 \pm 7.1	11.0 \pm 7.3	8.3 \pm 6.5
FRAT Score (mean \pm SD)	9.0 \pm 2.5	9.6 \pm 2.5	8.1 \pm 2.3
TUGT time (mean \pm SD)	14.1 \pm 8.6	15.5 \pm 8.7	12.2 \pm 8.2
Previous Fall (n (%))	115 (85%)	72 (91%)	43 (75%)
Fall in the last 12 months (n (%))	62 (46%)	46 (58%)	16 (28%)
Previous fracture from a fall (n (%))	52 (38%)	38 (48%)	14 (25%)
Use a walking aid (n (%))	82 (60%)	61 (77%)	21 (37%)

Fear of falling

The distribution of fear of falling scores is shown in Figure 3. Participants had a mean (SD) score of 12.1 (± 4.11) on the FES-I. Seventy-nine participants (58%) were found to have a high fear of falling.

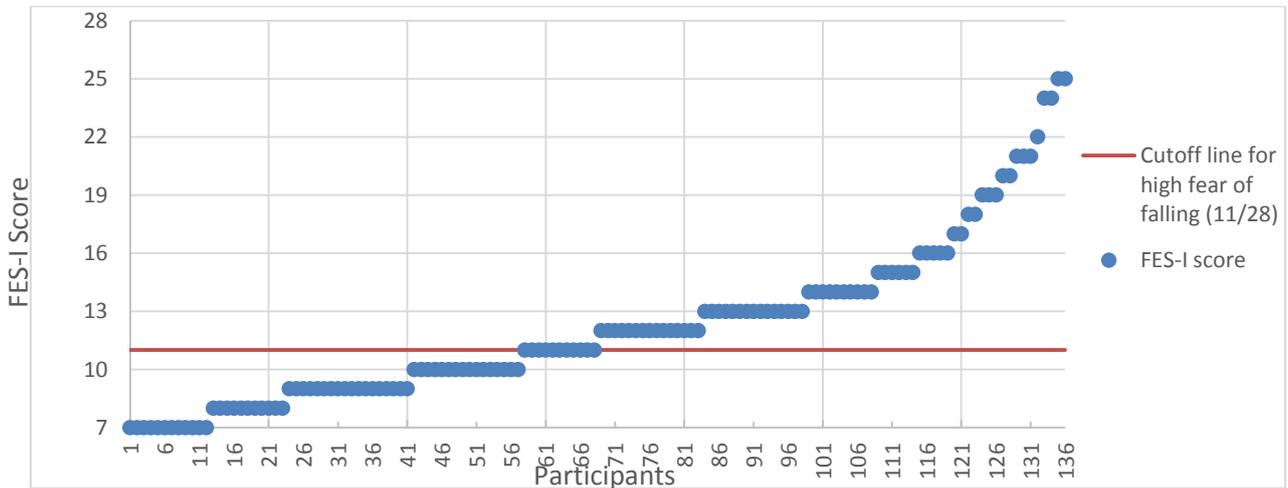


Figure 3: FES-1 scores per participant (n= 136)

Psychological measures

The psychological state of participants was analysed within this study. Of the participants, the scores within the DASS21 indicated that 37% (50/136) had clinical signs of depression, 51% (69/136) had clinical signs of anxiety and 20% (27/136) had clinical signs of stress.

Screening for falls

Participants had a median time of 12.1 seconds (mean of 13.8 seconds $SD \pm 8.6$ seconds) for the TUGT. Utilising the TUGT in isolation, 60% (82/136) of participants were predicted to be unlikely to fall and 40% (54/136) likely to fall. The FRAT found 81% (110/136) of participants to be a low risk of falls, 19% (26/136) to be medium risk of falling, with no participants were categorised into the high-risk category.

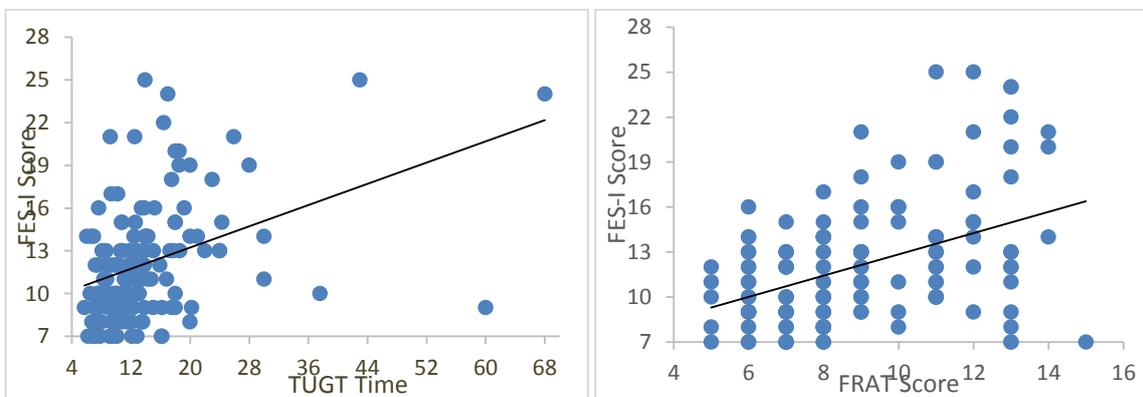


Figure 4 & 5: Relationships between FES-I scores and TUG Time and FRAT scores (n= 136)

Associations with fear of falling

The results of the univariate regression analyses exploring the associations between fear of falling (FES-I scores) and the independent variables are shown in Table 2. Age, gender, education, household membership and MSPSS score were not statistically significantly associated with fear of falling (each with $p > 0.05$). Number of medications, depression, anxiety, stress, FRAT score, TUGT time, previous falls, falls within the last 12 months and previous fracture from a fall were all independently and significantly associated with fear of falling in the univariate analyses.

Table 2: univariate linear regression analysis between variables and fear of falling

Predictor Variable	Relationship with fear of falling		
	R ²	p	coefficient
Age	0.02	0.096	-0.01
Gender female	0.03	0.066	0.11
Post-School Education	0.003	0.484	0.04
Household membership	0.001	0.69	0.02
Medications	0.11	<0.001	0.02
MSPSS Score	0.002	0.53	-0.001
Depression Score	0.14	<0.001	0.02
Anxiety Score	0.08	<0.001	0.01
Stress Score	0.14	<0.001	0.02
FRAT Score	0.16	<0.001	0.05
TUGT time	0.13	<0.001	0.01
Previous Fall	0.06	0.004	0.22
Fall in the last 12 months	0.12	<0.001	0.22
Previous fracture from a fall	0.04	0.017	0.13

Correlation calculations between the independent variables showed a strong correlation between the variables of ‘falls in the last 12 months’, ‘previous fall’ and ‘previous fracture from a fall’. As such, due to the stronger association between falls in the last 12 months and fear of falling, the variables ‘previous fall’ and ‘previous fracture from a fall’ were excluded from multivariate modelling. No other significant associations were found between the independent variables.

To develop the final multivariate linear regression model, nine predictor variables with a $p < 0.1$ on univariate analysis were entered. These included age, depression, anxiety, stress, TUGT, FRAT, medications, falls in the last 12 months and gender. The model contained four variables: stress score ($p < 0.001$), TUGT time ($p = 0.003$), number of prescribed medications ($p = 0.047$) and falls in the last 12 months ($p = 0.002$). The final model had a $F(4,131) = 15.11$, $p < 0.001$, indicating the model has a statistically significant ability to predict the outcome variable of fear of falling, due to a significant relationship between the model's predictors and fear of falling. This model accounted for 29.5% of the variance (adjusted R^2) in fear of falling (Table 3).

Explanatory Variables	Coefficient	Standard error	P-Value
Stress	0.01	0.003	<0.001
Timed up and Go Test	0.01	0.003	0.003
Medications	0.01	0.005	0.047
Falls in the last 12 months	0.15	0.470	0.002
Constant	2.07		

$R^2 = 0.3158$

Adjusted $R^2 = 0.2949$;

$F(4,131) = 15.11$, $p < 0.001$

Table 3. regression coefficients, standard error and P-values from the multivariate analysis with fear of falling as the dependent variable, with significance and proportion of variance explained by the model.

Discussion

Information about fear of falling in people in Australia is sparse and to the authors' knowledge, no previous studies have investigated factors associated with fear of falling in non-metropolitan areas. This study adds further evidence relating to the prevalence of fear of falling in Australia by reporting prevalence rates in community-dwelling older adults in regional Australia. The 58% prevalence of high fear of falling in this study is comparable with some studies performed overseas [26, 35-37] and higher [13, 24, 38] and lower [15, 20] in comparison to others. The variation in fear of falling prevalence rates within the literature is likely due to the different assessment tools utilised to identify fear of falling within the studies. Prevalence rates in studies using the FES-I are generally higher than those that use a yes/no response to the question "do you have a fear of falling?" [13, 15, 26, 35, 37, 38]. The FES-I was utilised in this study as it is more sensitive and reliable in detecting fear of falling than other methodologies, whilst it also provides a continuous variable, which cannot be obtained with a yes/no question [21, 28].

The mean age of 80.5 (± 6.7) years of the participants in this study was older than other comparable studies [13, 26]. Seventy-five percent of the studied population were female, which is similar to one study [15], but higher than others [13, 14, 26]. Whilst this ratio is high, this is reflective of the proportion of females who access Mercy Community Allied Health services, where the study was undertaken. Given that participants were recruited from a regional area, a possible explanation for this is that men are less likely to access health services, particularly in rural and regional locations [39]. A previous study has found that there are gender differences in fear of falling with respect to the prevalence and associated factors in older adults, with females more likely to experience fear of falling [26]. Hence, the results of this study are likely to be generalisable to services which provide interventions to older people or groups where females are in the majority.

Fear of falling is a multifaceted concept [11, 13, 15, 16, 26, 38]. In the final multivariate model, falls in the last 12 months makes the largest unique contribution to the variance in fear of falling, although stress, TUGT performance and the number of prescribed medications also make statistically significant contributions. Together, these four variables account for 29% of the variability in fear of falling, with statistical analysis showing that the defined model has a statistically significant ($p < 0.001$) ability to predict fear of falling. As such, in addressing a client's level of fear of falling, clinicians and researchers need to consider interventions targeted at the four identified factors.

The findings of this study reflect that history of a fracture from a fall ($p < 0.05$), previous falls ($p < 0.01$) and fall in the past 12 months ($p < 0.001$) were all individually associated with fear of falling. Hence, this study adds to the existing body of research showing that people with a history of falls are more likely to have a fear of falling [4, 5, 16], highlighting the need for

primary health clinicians to appreciate the psychological impact of a fall. Early referrals to falls prevention programs that build falls-related self-efficacy are therefore indicated for people after falling, irrespective of physical function and health status. Providing early referrals to falls programs for people after a fall, will help prevent further falls and also prevent the development of the psychological consequences of fear of falling.

A person's psychological state, through stress, anxiety and depression were all individually associated with fear of falling in this study. The association between stress and fear of falling has not previously been examined and this association was found to be significant ($p < 0.001$), culminating in inclusion within the fear of falling prediction model. Anxiety and depression have been noted as factors associated with fear of falling in previous studies [10, 15, 26, 40]. Whilst the association between fear of falling and anxiety and depression was strong when tested in isolation (univariate testing), once all other factors were considered (multivariate testing), anxiety and depression were not significantly associated with fear of falling. The results of this study indicate the significant role that stress plays in the perception of fear of falling. Interventions that target stress have not previously been incorporated into falls programs. As such, research is required to examine the effect of incorporating different forms of stress management strategies into falls prevention programs.

Participant TUGT performance was found to be significantly associated ($p = 0.003$) with fear of falling, supporting a previous study in which an association was also identified [13]. As the participants had a mean time over 14 seconds in the TUGT, this indicates that participants of this study were well below the average functional mobility level for their age. Falls programs traditionally focus on exercises that target balance, gait, coordination and strengthening [41]. The results of this study indicate the need to examine the effectiveness of incorporation of functional mobility exercises that target rapid position change, as measured by the TUGT, within falls prevention programs.

The average consumption of more than seven medications per day in the current study was higher than reported in previous studies looking at fear of falling and may be due partly to the higher average age of participants in the current study [11, 13, 15]. Taking seven medications is indicative of a population with increased co-morbidities and lower perceived health-related quality of life [42, 43]. Previous studies have also found an association with number of co-morbidities and fear of falling [15], which is also implied by this pharmaceutical association.

After all of the assessed factors had been accounted for, a significant association ($p < 0.05$) remained between the number of prescribed medications and fear of falling. Medication has long been identified as a factor contributing to falls and discussion regarding medications is often included within falls prevention programs [3]. Given that this study highlights the association of number of medications prescribed with fear of falling, consideration is required to the incorporation of pharmaceutical minimisation into falls programs. A prescribing medication modification program for primary care physicians has previously

been shown to be associated with a significant reduction in falls risk [3]. Further research is indicated to assess the impact of a comprehensive medication review and pharmaceutical minimisation on fear of falling.

The complexity of the concept of fear of falling needs to be acknowledged. The identified factors of falls in the last 12 months, stress, medications, functional mobility and fear of falling are to an extent all interrelated, despite not being significantly correlated with each other from a statistical perspective. Given the inclusion of prescribed medications and stress within the fear of falling prediction model, research regarding pharmaceutical review specific to medications targeted at mental health is indicated in falls programs.

Stress, depression and anxiety were all shown within this study to be individually associated with fear of falling. To date, no literature exists examining whether falls prevention programs have a negative or positive effect on a person's psychological state. Falls prevention programs may increase fear of falling and negatively impact psychological state by focusing on risks and intensifying fears. Conversely, falls programs may reduce psychological distress by empowering individuals through increased physical function. Future research aimed at gaining an understanding of the impact of falls prevention programs on client levels of fear of falling, stress, anxiety and depression would enhance the ability of these programs to provide a holistic approach to client care.

Previous studies have highlighted age, use of a walking aid, education level, household membership, and level of social support as having an association with fear of falling [13-15, 26]. However, there was no statistically significant association found with these variables and fear of falling within this study. A previous study found an association with a falls screening tool and fear of falling [13]. This study established an association between the FRAT falls screening tool and fear of falling ($p < 0.001$), however once all other factors were taken into consideration, this association was not significant with fear of falling. These variations in findings across the studies may be explained by the differences in assessment tools utilised, different population characteristics, and the research setting. The assessment tools utilised in this study were chosen due to their high level of specificity and sensitivity in the domains they are assessing. All of the previous studies were performed overseas in metropolitan areas, with data collected in a variety of different community settings [13-15, 26], whereas this study was undertaken in a regional population within Australia in a single-site health setting. As such, these results indicate that the factors of age, use of a walking aid, education level, household membership and level of social support, may not be associated factors to fear of falling in an Australian or regional context.

Limitations

This study has several limitations. Despite a variety of factors being considered within this study and the statistically significant final predictor model, more than half of the variance in fear of falling was not explained by this model, further demonstrating the complex nature of fear of falling. Due to the cross-sectional approach of this study, the causal relationship between the identified factors and fear of falling was not determined. As previously discussed, there is potential of sample selection bias, as participants self-selected whether to participate in this study. Additionally, convenience sampling was utilised, with participants obtained from those attending a single site allied health service. By doing this, the study did not include those that were not willing to attend the service, which may occur in those with a high fear of falling. Additionally, the selection criteria excluded those that were not mobile and people with cognitive deficits. Together, these limitations may reduce the generalisability of the results. Additionally, there is a possibility of performance bias and self-report bias, as the majority of participants participated in a group setting, with participants potentially influenced by others and most of the data was collected through questionnaires. Performance and self-report bias has been shown to at times to lead to inaccurate information. However methodological steps were taken within this study to reduce the impact of these bias. These steps included making providing multiple areas and rooms to complete the questionnaire, thorough participant briefing and providing the study information sheet to participants prior to participation to inform them of the requirements.

Strengths

This is a landmark study, looking for the first time at factors associated with fear of falling in Australia and for the first time in the world, in a non-metropolitan setting. Looking at factors within the regional Australian demographic has highlighted some distinct differences to studies performed previously in other metropolitan parts of the world. Given the age and demographic of the participants, the results are relatable and generalisable to most Australian community health settings, particularly for community health providers that run exercise and falls programs for community-dwelling older people. The sample size obtained was adequate for statistical power. The cross-sectional nature of this study provided the researchers with an accurate snapshot of the studied population at a certain time-point, allowing for examination of the association between the chosen variables with fear of falling as well as allowing for calculation of prevalence of fear of falling within the study cohort.

Recommendations

Service provision recommendations

- Fear of falling is highly prevalent and is an important multifaceted factor that needs to be considered and measured within falls prevention programs as a separate entity to previous falls and falls risk.
- Primary health clinicians need to appreciate that in addition to physical functioning and health status, that there is a psychological association with a fall.
- This study informs clinicians of factors associated with fear of falling, highlighting that higher stress levels, more prescribed medications, reduced mobility performance and a recent history of falls are all significantly associated.
- Clinicians need to ensure people who have had a fall, irrespective of physical and health status, are referred to falls programs that incorporate a biopsychosocial approach to building falls-related self-efficacy.
- Clinicians need to consider within falls prevention programs, interventions that target stress management and reduce prescribed medications, particularly for those with a recent history of falls.
- Within falls programs, exercises that focus on rapid position changes and functional mobility should be considered for those with a fear of falling.

Recommendations for future research

- Due to the cross-sectional approach of this study, the causal relationship between the independent variables and fear of falling was not established. To comprehensively explain fear of falling, future research should consider longitudinal studies to understand the causes of fear of falling.
- Future research needs to focus on evaluation of the impact of interventions on fear of falling levels, determining whether fear of falling can be reduced with intervention.
- This study highlights the need for research into a multi-factorial biopsychosocial approach to falls prevention, considering interventions targeted at stress management, prevention of falls, improving functional mobility and reducing prescribed medications.
- Due to the association between the TUGT time and fear of falling, research is required comparing traditional exercise-based falls interventions to interventions that incorporate functional mobility exercises that target rapid position change.
- Given the association of number of prescribed medications with fear of falling, consideration is required into ways of incorporating a safe medication reduction program into falls prevention programs.

Conclusion

Fear of falling is an important factor that needs to be considered and measured within falls prevention programs. High fear of falling was found to be present in 58% of participants in this study, further highlighting the prevalence of fear of falling within Australia. Additionally, this study is the first to highlight that fear of falling is also prevalent in non-metropolitan regions.

This study is the first of its kind to explore factors associated with fear of falling in an Australian setting. Through multivariate analysis, this study defined a model that included four factors that were found to be significantly associated with a higher level of fear of falling. The defined model was found to be statistically significant in accounting for the variability in fear of falling, through incorporation of higher stress levels, higher number of prescribed medications, slower TUGT time and a history of falls in the last 12 months.

The results of this study further highlight the complexity of fear of falling. Longitudinal studies are required that permit conclusions about the cause or treatment of fear of falling. The study's multivariate model suggests that it is vital to develop multi-dimensional strategies for reducing fear of falling in community-dwelling older people. The results of this study indicate that clinicians and researchers should further consider pharmaceutical reduction, stress management and therapies targeting rapid position changes and functional mobility, in developing falls prevention programs, particularly for those with a recent history of falls. Future studies therefore need to explore the impact of adding strategies that target these biomedical, contextual and psychological factors to traditional falls prevention interventions.

References

1. NSW Ministry of Health, *Population Health Priorities for NSW: 2012–2017*, Population and Public Health Division, Editor. 2012, NSW Ministry of Health: Sydney.
2. NSW Department of Health, *Prevention of falls and harm from falls among older people: 2011-2015*, C.f.H. Advancement, Editor. 2011, Centre for Health Advancement: North Ryde, NSW.
3. Gillespie, L.D., et al., *Interventions for preventing falls in older people living in the community*. Cochrane Database of Systematic Reviews, 2012(9).
4. Tinetti, M.E. and M. Speechley, *Risk factors for falls among elderly persons*. New England Journal of Medicine, 1988. **319**(26): p. 1701.
5. NSW Department of Health, *The health of the people of NSW – Report to the Chief Health Officer (data book)*, P.H. Division, Editor. 2008: Sydney, NSW.
6. Centre for Epidemiology and Evidence, *NSW Combined Admitted Patient Epidemiology Data and ABS population estimates (SAPHARI): Fall-related injury hospitalisations*. 2015, NSW Ministry of Health,.
7. Watson, W., A. Clapperton, and R. Mitchell, *The incidence and cost of falls injury among older people in NSW 2006/2007*, NSW Department of Health, Editor. 2010, NSW Department of Health,: Sydney, NSW.
8. Yardley, L., et al., *Attitudes and Beliefs That Predict Older People's Intention to Undertake Strength and Balance Training*. Journals of Gerontology Series B: Psychological Sciences & Social Sciences, 2007. **62B**(2): p. 119-125.
9. Gilbert, R., et al., *Socio-demographic factors predict the likelihood of not returning home after hospital admission following a fall*. Journal of Public Health, 2010. **32**(1): p. 117-124.
10. Delbaere, K., et al., *A multifactorial approach to understanding fall risk in older people*. Journal of the American Geriatrics Society, 2010. **58**(9): p. 1679-1685.
11. Andresen, E.M., et al., *Cross-Sectional and Longitudinal Risk Factors for Falls, Fear of Falling, and Falls Efficacy in a Cohort of Middle-Aged African Americans*. Gerontologist, 2006. **46**(2): p. 249-257.
12. Cumming, R.G. and G. Salkeld, *Prospective Study of the Impact of Fear of Falling on Activities of Daily Living, SF-36 Scores, and Nursing Home Admission*. Journals of Gerontology Series A: Biological Sciences & Medical Sciences, 2000. **55A**(5): p. M299-M305.
13. Kumar, A., et al., *Which factors are associated with fear of falling in community-dwelling older people?* Age & Ageing, 2014. **43**(1): p. 76-84.
14. Kwan, M.M.S., et al., *Increased Concern Is Protective for Falls in Chinese Older People: The Chopstix Fall Risk Study*. Journals of Gerontology Series A: Biological Sciences & Medical Sciences, 2013. **68**(8): p. 946-953.
15. Liu, J.Y.W., *Fear of falling in robust community-dwelling older people: results of a cross-sectional study*. Journal of Clinical Nursing, 2015. **24**(3/4): p. 393-405.
16. Scheffer, A.C., et al., *Fear of falling: measurement strategy, prevalence, risk factors and consequences among older persons*. Age & Ageing, 2008. **37**(1): p. 19-24.
17. Gagnon, N., et al., *Affective Correlates of Fear of Falling in Elderly Persons*. The American Journal of Geriatric Psychiatry, 2005. **13**(1): p. 7-14.
18. Vellas, B.J. and S.J. Wayne, *Fear of falling and restriction of mobility in elderly fallers*. Age & Ageing, 1997. **26**(3): p. 189.
19. Wetherell, J.L., et al., *Activity, balance, learning, and exposure (ABLE): a new intervention for fear of falling*. International Journal of Geriatric Psychiatry, 2016. **31**(7): p. 791-798.
20. Salkeld, G., et al., *Quality of life related to fear of falling and hip fracture in older women: a time trade off study...including commentary by Ameratung SN and Brown PM*. BMJ: British Medical Journal (International Edition), 2000. **320**(7231): p. 341-346.

21. Tinetti, M.E. and C.F.M. de Leon, *Fear of falling and fall-related efficacy in relationship to functioning among community-living*. Journal of Gerontology, 1994. **49**(3): p. M140.
22. Legters, K., *Fear of Falling*. Physical Therapy, 2002. **82**(3): p. 264-272.
23. Tennstedt, S. and J. Howland, *A randomized, controlled trial of a group intervention to reduce fear of falling and associated*. Journals of Gerontology Series B: Psychological Sciences & Social Sciences, 1998. **53B**(6): p. P384.
24. Butler, A.A., et al., *Ability versus hazard: risk-taking and falls in older people*. Journals of Gerontology Series A: Biological Sciences & Medical Sciences, 2015. **70**(5): p. 628-634.
25. Holland, C.A. and P.M.A. Rabbitt, *People's Awareness of their Age-related Sensory and Cognitive Defecits and the Implications for Road Safety*. Applied Cognitive Psychology, 1992. **6**(3): p. 217-231.
26. Chang, H.-T., H.-C. Chen, and P. Chou, *Factors Associated with Fear of Falling among Community-Dwelling Older Adults in the Shih-Pai Study in Taiwan*. PLoS ONE, 2016. **11**(3): p. 1-12.
27. Keleher, H., MacDougall, Colin, *Understanding health* 3ed. 2011, South Melbourne, Vic. : Oxford University Press.
28. Kempen, G.I.J., et al., *The Short FES-I: a shortened version of the Falls Efficacy Scale-International to assess fear of falling*. Age & Ageing, 2008. **37**(1): p. 45-50.
29. Zimet, G.D., et al., *The Multidimensional Scale of Perceived Social Support*. Journal of Personality Assessment, 1988. **52**(1): p. 30.
30. Henry, J.D. and J.R. Crawford, *The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample*. British Journal of Clinical Psychology, 2005. **44**(2): p. 227-239.
31. Shumway-Cook, A., S. Brauer, and M. Woollacott, *Predicting the probability for falls in community-dwelling older adults using the Timed Up & Go Test*. Physical Therapy, 2000. **80**(9): p. 896-903.
32. Podsiadlo, D. and S. Richardson, *The timed "Up & Go": A test of basic functional mobility for frail elderly persons*. Journal of the American Geriatric Society, 1991. **39**: p. 142-148.
33. Steffen, T. and M. Seney, *Test-Retest Reliability and Minimal Detectable Change on Balance and Ambulation Tests, the 36-Item Short-Form Health Survey, and the Unified Parkinson Disease Rating Scale in People With Parkinsonism*. Physical Therapy, 2008. **88**(6): p. 733-746.
34. Stapleton, C., et al., *Four-item fall risk screening tool for subacute and residential aged care: the first step in fall prevention*. Australasian Journal on Ageing, 2009. **28**(3): p. 139-143.
35. Mendes da Costa, E., et al., *Fear of falling and associated activity restriction in older people. results of a cross-sectional study conducted in a Belgian town*. Archives of Public Health, 2012. **70**(1): p. 1-1.
36. Jellesmark, A., et al., *Fear of falling and changed functional ability following hip fracture among community-dwelling elderly people: an explanatory sequential mixed method study*. Disability & Rehabilitation, 2012. **34**(25): p. 2124-2131.
37. Zijlstra, G.A.R., et al., *Prevalence and correlates of fear of falling, and associated avoidance of activity in the general population of community-living older people*. Age & Ageing, 2007. **36**(3): p. 304-309.
38. Arfken, C.L., et al., *The Prevalence and Correlates of Fear of Falling in Elderly Persons Living in the Community*. American Journal of Public Health, 1994. **84**(4): p. 565-570.
39. Radermacher, H. and S. Feldman, *'Health is their heart, their legs, their back': understanding ageing well in ethnically diverse older men in rural Australia*. Ageing and Society, 2015. **35**(5): p. 1011-1031.
40. van Haastregt, J.C.M., et al., *Feasibility of a cognitive behavioural group intervention to reduce fear of falling and associated avoidance of activity in community-living older people: a process evaluation*. BMC Health Services Research, 2007. **7**: p. 156-164.
41. Howe, T.E., et al., *Exercise for improving balance in older people*. Cochrane Database of Systematic Reviews, 2011(11).
42. Classen, S., et al., *Relationship of number of medications to functional status, health, and quality of life for the frail home-based older adult*. OTJR: Occupation, Participation & Health, 2004. **24**(4): p. 151-160.
43. Andersson, L.B., J. Marcusson, and E. Wressle, *Health-related quality of life and activities of daily living in 85-year-olds in Sweden*. Health & Social Care in the Community, 2014. **22**(4): p. 368-374.

Appendix 1

RESEARCH DATA COLLECTION FORM



Peter Sirr
APA Titled Gerontological Physiotherapist

Email: psirr@mercy.com.au

PARTICIPANT DETAILS	
NAME	POSTCODE
AGE	years old MALE <input type="checkbox"/> FEMALE <input type="checkbox"/>
EDUCATIONAL LEVEL (SEIFA index, 2011)	<input type="checkbox"/> No School Certificate or other qualifications <input type="checkbox"/> School or Intermediate Certificate (or equivalent) <input type="checkbox"/> Higher School or Leaving Certificate (or equivalent) <input type="checkbox"/> Trade/Apprenticeship (e.g. hairdresser, chef) <input type="checkbox"/> Certificate/Diploma (e.g. Child care, technician) <input type="checkbox"/> University Degree or higher
HOUSEHOLD MEMBERSHIP	Including yourself, how many people in total live in your household <input type="text"/> <input type="text"/> people (put "1" if you live alone)
MARITAL STATUS What best describes your current situation (tick one box)	<input type="checkbox"/> single <input type="checkbox"/> widowed <input type="checkbox"/> married <input type="checkbox"/> divorced <input type="checkbox"/> de facto / living with a partner <input type="checkbox"/> separated
DO YOU USE A WALKING AID (walker, walking stick, crutch, walking frame or other)	YES <input type="checkbox"/> NO <input type="checkbox"/>
HAVE YOU <u>EVER</u> HAD A FALL? (defined as coming to rest inadvertently on the ground or floor or other lower level)	YES <input type="checkbox"/> NO <input type="checkbox"/>
HAVE YOU HAD A FALL IN THE <u>LAST 12 MONTHS</u>?	YES <input type="checkbox"/> NO <input type="checkbox"/>
HAVE YOU HAD A FRACTURE AS A RESULT OF A FALL?	YES <input type="checkbox"/> NO <input type="checkbox"/>
NUMBER OF PRESCRIBED MEDICATIONS PER DAY	<input type="text"/> <input type="text"/>

**RESEARCH DATA
COLLECTION FORM**



Peter Sirr
APA Titled Gerontological Physiotherapist

Email: psirr@mercy.com.au

Shortened Falls Efficacy Scale-International

Now we would like to ask some questions about how concerned you are about the possibility of falling. Please reply, thinking about how you usually do the activity. If you currently do not engage in the activity, please answer whether you think you would be concerned about falling IF you did the activity. For each of the following activities, please tick the box which is closest to your own opinion to show how concerned you are that you might fall if you undertook this activity.

	Not at all Concerned 1	Somewhat Concerned 2	Fairly Concerned 3	Very Concerned 4
Getting dressed or undressed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Taking a bath or shower	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Getting in or out of a chair	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Going up or down stairs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reaching for something above your head or on the ground	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Walking up or down a slope	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Going out to a social event (e.g. religious service, family gathering or club meeting)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

OFFICE USE ONLY	Total: /28
------------------------	------------

**RESEARCH DATA
COLLECTION FORM**



Peter Sirr
APA Titled Gerontological Physiotherapist

Email: psirr@mercy.com.au

The Multidimensional Scale of Perceived Social Support

We are interested in how you feel about the following statements. Read each statement carefully. Please circle how you feel about each statement.

Very						Very
Strongly	Strongly	Mildly	Neutral	Mildly	Strongly	Strongly
Disagree	Disagree	Disagree	Neutral	Agree	Agree	Agree
1	2	3	4	5	6	7

1	There is a special person who is around when I am in need.	1	2	3	4	5	6	7
2	There is a special person with whom I can share my joys and sorrows.	1	2	3	4	5	6	7
3	My family really tries to help me.	1	2	3	4	5	6	7
4	I get the emotional help and support I need from my family.	1	2	3	4	5	6	7
5	I have a special person who is a real source of comfort to me.	1	2	3	4	5	6	7
6	My friends really try to help me.	1	2	3	4	5	6	7
7	I can count on my friends when things go wrong.	1	2	3	4	5	6	7
8	I can talk about my problems with my family.	1	2	3	4	5	6	7
9	I have friends with whom I can share my joys and sorrows.	1	2	3	4	5	6	7
10	There is a special person in my life who cares about my feelings.	1	2	3	4	5	6	7
11	My family is willing to help me make decisions.	1	2	3	4	5	6	7
12	I can talk about my problems with my friends.	1	2	3	4	5	6	7

OFFICE USE ONLY	Total: /84
------------------------	------------

**RESEARCH DATA
COLLECTION FORM**



Peter Sirr
APA Titled Gerontological Physiotherapist

Email: psirr@mercy.com.au

DASS 21

Please read each statement and circle a number 0, 1, 2, or 3 which indicates how much the statement applied to you **OVER THE PAST WEEK**. There are no right or wrong answers. Do not spend too much time on any statement

0	Did not apply to me at all	NEVER (N)
1	Applied to me to some degree, or some of the time	SOMETIMES (S)
2	Applied to me to a considerable degree, or a good part of the time	OFTEN (O)
3	Applied to me very much, or most of the time	ALMOST ALWAYS (AA)

		N	S	O	AA	OFFICE USE ONLY		
						D	A	S
1	I found it hard to wind down.	0	1	2	3			
2	I was aware of dryness of my mouth.	0	1	2	3			
3	I couldn't seem to experience any positive feeling at all	0	1	2	3			
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3			
5	I found it difficult to work up the initiative to do things	0	1	2	3			
6	I tended to over-react to situations	0	1	2	3			
7	I experienced trembling (eg, in the hands)	0	1	2	3			
8	I felt that I was using a lot of nervous energy	0	1	2	3			
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3			
10	I felt that I had nothing to look forward to	0	1	2	3			
11	I found myself getting agitated	0	1	2	3			
12	I found it difficult to relax	0	1	2	3			
13	I felt down-hearted and blue	0	1	2	3			
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3			
15	I felt I was close to panic	0	1	2	3			
16	I was unable to become enthusiastic about anything	0	1	2	3			
17	I felt I wasn't worth much as a person	0	1	2	3			
18	I felt that I was rather touchy	0	1	2	3			
19	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3			
20	I felt scared without any good reason	0	1	2	3			
21	I felt that life was meaningless	0	1	2	3			
TOTALS								

**RESEARCH DATA
COLLECTION FORM**



Peter Sirr
APA Titled Gerontological Physiotherapist

Email: psirr@mercy.com.au

To Be Completed By Therapist

Falls Risk Assessment Tool		
RISK FACTOR	LEVEL	RISK SCORE
RECENT FALLS	None in last 12 months one or more between 3 and 12 months ago one or more in last 3 months one or more in last 3 months whilst inpatient / resident	2 4 6 8
MEDICATIONS <small>(sedatives, anti-depressants, anti-Parkinson's, diuretics, anti-hypertensives, hypnotics)</small>	Not taking any of these Taking one Taking two Taking more than two	1 2 3 4
PSYCHOLOGICAL <small>(Anxiety, depression, ↓Cooperation, ↓Insight or ↓judgement, esp. re: mobility)</small>	does not appear to have any of these appears mildly affected by one or more appears moderately affected by one or more appears severely affected by one or more	1 2 3 4
COGNITIVE STATUS	Intact Mildly impaired Moderately impaired Severely impaired	1 2 3 4
(Low Risk: 5-11 Medium: Risk: 12-15 High Risk: 16-20) Risk Score		/20
Timed Up and Go Test		<input style="width: 30px; height: 20px;" type="text"/> <input style="width: 30px; height: 20px;" type="text"/> seconds

TOTALS

DASS <small>(multiply scores x2)</small>	Depression Score =	Anxiety Score =	Stress Score =	MSPSS	Total: /84	FES-I short	Total: /28
Normal	<input type="checkbox"/> 0-9	<input type="checkbox"/> 0-7	<input type="checkbox"/> 0-14	69-84	<input type="checkbox"/> HIGH ACUITY	14-28	<input type="checkbox"/> HIGH CONCERN
Mild	<input type="checkbox"/> 10-13	<input type="checkbox"/> 8-9	<input type="checkbox"/> 15-18	49-68	<input type="checkbox"/> MEDIUM ACUITY	9-13	<input type="checkbox"/> MEDIUM CONCERN
Moderate	<input type="checkbox"/> 14-20	<input type="checkbox"/> 10-14	<input type="checkbox"/> 19-25	12-48	<input type="checkbox"/> LOW ACUITY	7-8	<input type="checkbox"/> LOW CONCERN
Severe	<input type="checkbox"/> 21-27	<input type="checkbox"/> 15-19	<input type="checkbox"/> 26-33				
Extremely severe	<input type="checkbox"/> 28+	<input type="checkbox"/> 20+	<input type="checkbox"/> 34+				