

1-1-2023

Factors associated with family carers' fall concern: Prospective study protocol

Seng Giap Marcus Ang
Edith Cowan University

Rosemary Saunders
Edith Cowan University

Chiew Jiat Rosalind Siah

Charlotte Foskett

Christopher Etherton-Beer

See next page for additional authors

Follow this and additional works at: <https://ro.ecu.edu.au/ecuworks2022-2026>



Part of the [Medicine and Health Sciences Commons](#)

[10.1016/j.colegn.2023.07.004](https://doi.org/10.1016/j.colegn.2023.07.004)

Ang, S. G. M., Saunders, R., Siah, C. J. R., Foskett, C., Etherton-Beer, C., Gullick, K., ... & Wilson, A. (2023). Factors associated with family carers' fall concern: Prospective study protocol. *Collegian*, 30(5), 647-652. <https://doi.org/10.1016/j.colegn.2023.07.004>

This Journal Article is posted at Research Online.
<https://ro.ecu.edu.au/ecuworks2022-2026/3004>

Authors

Seng Giap Marcus Ang, Rosemary Saunders, Chiew Jiat Rosalind Siah, Charlotte Foskett, Christopher Etherton-Ber, Karen Gullick, Melissa Dunham, Nicolette Sagaram, Rhea Rodriguez Tecson, Sue Haydon, and Amanda Wilson



ELSEVIER

Contents lists available at ScienceDirect

Collegian

journal homepage: www.elsevier.com/locate/colegn

Research paper

Factors associated with family carers' fall concern: Prospective study protocol



Seng Giap Marcus Ang^{a,b,*}, Rosemary Saunders^{a,b}, Chiew Jiat Rosalind Siah^c,
Charlotte Foskett^b, Christopher Etherton-Beer^d, Karen Gullick^b, Melissa Dunham^a,
Nicolette Sagaram^b, Rhea Rodriguez Tecson^b, Sue Haydon^b, Amanda Wilson^e

^a Centre for Research in Aged Care, School of Nursing and Midwifery, Edith Cowan University, Joondalup, Australia

^b Hollywood Private Hospital, Nedlands, Australia

^c Alice Lee Centre for Nursing Studies, Yong Loo Lin School of Medicine, National University of Singapore, Singapore

^d Medical School, The University of Western Australia, Crawley, Australia

^e School of Nursing and Midwifery, Faculty of Health, University of Technology Sydney, Ultimo, Australia

ARTICLE INFO

Article history:

Received 4 July 2022

Received in revised form 9 April 2023

Accepted 24 July 2023

Keywords:

Family carer

Older people

Fall concern

Fall risk

Fear of falling

Prospective study

ABSTRACT

Background: Family carers are important in preventing community-dwelling older people from falling. Family carers' concerns about older people's risk of falling could affect their own physical and psychological health, lifestyle, and burden of care. While there are many studies exploring factors associated with fear of falling among older people, there is no research on family carers' fall concern of older people (care recipients) who are hospitalised.

Aim: This paper describes a prospective study protocol exploring the relationship of fall concern, psychological distress, and quality of life of family carers when their care recipient is hospitalised and after discharge.

Methods: The study will recruit 180 family carers and older people. Family carers providing support for an older person without cognitive impairment who has been admitted to a private metropolitan hospital in Western Australia and assessed to have a risk of falling will be included. Data will be collected using an interviewer-administered survey. All participants will complete the survey within 48 h before the patient's discharge, follow-up one week later (only for family carers), and again 30 days after the patient is discharged. Data related to falls, fall concern, psychological distress, and quality of life will be obtained from family carers and care recipients.

Discussion: This study will provide deeper understanding about the factors affecting fall concern among family carers of older people during hospitalisation and after discharge. This will help healthcare professionals better support family carers to implement fall prevention strategies for older people whilst in hospital and in the community.

© 2023 Australian College of Nursing Ltd. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

* Correspondence to: School of Nursing and Midwifery, Edith Cowan University, 270 Joondalup Drive, Joondalup, WA 6027, Australia.

E-mail address: s.ang@ecu.edu.au (S.G.M. Ang).

Summary of relevance**Problem or Issue**

While there are many studies exploring factors associated with fear of falling among older people, research into carers' concern about the risk of falling of older people who are hospitalised is limited.

What is already known

Family carers experience fall-related distress due to concerns about their care recipients falling. The Carers' Fall Concern Instrument was developed to measure carers' fall concern in the community.

What this paper adds

This paper describes a prospective study protocol exploring the association between fall concern, psychological distress, and quality of life among family carers of older people during hospitalisation and after discharge.

Acknowledgements

We would like to thank the participating wards at Hollywood Private Hospital for supporting the recruitment of participants. We also would like to thank the Centre for Research in Aged Care for providing the discretionary fund to support the preparation of this paper and Professor Davina Porock for providing her advice and support in reviewing the initial project proposal.

1. Introduction

A fall is defined as an unexpected event in which the patient comes to rest on the ground, floor, or lower level (Abendroth, Lutz, & Young, 2012; World Health Organisation, 2007). Falls are a major public health problem in the world with approximately 684,000 fatal falls occurring each year and 37.3 million falls require medical attention (World Health Organisation, 2018). Likewise, in Australia, falls are the leading cause of injuries causing hospitalisation and deaths with 43% of hospitalisations and 39% of deaths due to injury resulted from falls between 2018 and 2019 (Australian Institute of Health and Welfare, 2022). The rate of hospitalisations and deaths due to falls was the highest among people aged 65 and over (Australian Institute of Health and Welfare, 2022). Recent evidence suggests family carers experienced concern about older people falling and this concern could affect their physical and psychological health, lifestyle, and burden of care (Ang, O'Brien, & Wilson, 2020a). A Carers' Fall Concern Instrument (CFC-I) was developed to identify different situations contributing to carers' fall concern and target interventions to prevent older people from falling (Ang, O'Brien, & Wilson, 2020b). This paper describes a prospective study protocol exploring the relationship of fall concern, psychological distress, and quality of life of family carers. The longitudinal design will also provide insight into the changes in fall concern of family carers when their older people are hospitalised and after discharge.

2. Background

Fear of falling is associated with poor physical and functional outcomes among older people (Cumming, Salkeld, Thomas, & Szonyi, 2000). In a cohort study, Gazibara et al. (2017) reported that older people who had fallen over the past six months were four times more likely to experience fear of falling. This concern about falling was linked to activity restriction, functional impairment, and an increased risk of falling (Cumming et al., 2000; Hughes, Kneebone, Jones, & Brady, 2015). Another cohort study, Auais et al. (2018) found that fear of falling predicted mobility disability and poorer physical performance among older people over a two-year follow-up. A

review of psychological factors associated with fall-related concerns reported that fear of falling was associated with activity avoidance and poorer quality of life among older people (Hughes et al., 2015). While many studies have investigated the factors associated with fear of falling among older people, research into carers' concern about the risk of falling of their care recipient is limited.

Many family carers support older people who have healthcare conditions such as increasing frailty, dementia, or other life-limiting illnesses. By supporting their daily activities, family carers help older people live at home longer. Active participation of family carers is critical in preventing community-dwelling older people from falling (Wilkinson et al., 2018; World Health Organisation, 2007). Family carers should be involved in discussions about older people's risk of falling and fall prevention strategies, as they know the care recipients well and the best ways to support them (Australian Commission on Safety and Quality in Health Care, 2017). The occurrence of a fall among older people could contribute to emotional difficulty for family carers, which has implications for post-discharge care (Leggett, Polenick, Maust, & Kales, 2018).

Family carers experience distress due to concerns about their care recipients falling. In an integrative review, Ang et al. (2020a) found that concern about older people falling again can cause negative psychological impact such as stress, depression, and anxiety, along with decreased social engagements and changes to their daily routines. While some family carers accept that their care recipients who are frail will fall again, they experience ongoing fear and anxiety (Lees, O'Brien, & Maganaris, 2021). Family carers experience a significant increase in caregiving burden if the care recipients sustain a fall (Dow, Meyer, Moore, & Hill, 2013; Kuzuya et al., 2006). Increase in burden of care for family carers can be attributed to the need to change their routines and a fear of leaving their care recipients alone at home (Dow et al., 2013). Carers also have increased levels of care after their care recipients sustain a fall injury (Dow et al., 2013).

Carers who have a high degree of concern may become over-protective further reducing their care recipients' independence (Honaker & Kretschmer, 2014). Among professional caregivers, such as nurses and nursing aids, fear of residents with dementia falling was predictive of activity restriction, declining functional ability, and falls related to injury at three-months' follow-up (Dever Fitzgerald, Hadjistavropoulos, & MacNab, 2009). In order to support family carers to prevent older people from falling at home, a better understanding of their concerns is needed (Wilkinson et al., 2018).

The CFC-I was developed to quantify and explore the impact of older people's fall risk on their family carers (Ang et al., 2020b). Preliminary analysis of the 16-item CFC-I using a cross-sectional study reported strong item-total correlations of 0.51–0.76, mean inter-item correlations of 0.47, factor loadings 0.557–0.809, and internal reliability of 0.93 (DeVon et al., 2007). However, the study was limited to exploring the construct validity of the instrument among family carers looking after a general population of older people. The current prospective study will explore the relationship between fall concern and other psychosocial health variables among family carers and their older people without cognitive impairment, as well as further strengthen understanding of the psychometric properties of the CFC-I among older people at risk of falling. By addressing the factors associated with fall concern in family carers, the study will inform future strategies, including the format, approach and content of patient, and family education on fall prevention at home.

3. Aims

The aim of this study is to investigate the relationship between fall concern, psychological distress, and quality of life of family carers when the care recipient is hospitalised and after discharge. A secondary aim of this study is to evaluate the validity and reliability

of the CFC-I among family carers of older people with an assessed risk of falling but no cognitive impairment. For the purposes of the study design, the older person being cared for by their family carer will be referred to as the care recipient.

4. Methods

4.1. Design

A prospective cohort study design will be used to determine the directionality of the association between carers' level of fall concern and incidences of falls and fear of falling. Recruitment will occur between September 2021 and December 2022. The study protocol has been approved by the study hospital (HREC 2129W) Human Research Ethics Committee (HREC) with reciprocal approval from the university HREC (2021-02933-ANG).

4.2. Participants and setting

This study will be conducted in the medical and surgical wards at the largest private hospital in Western Australia with 920 licensed beds. The hospital provides care for patients across a wide range of disciplines, including cardiology, gastroenterology, general medicine, general surgery, neurosurgery, oncology, orthopaedics, palliative care, psychiatry, rehabilitation, and urology. Care recipient aged 65 years and older, admitted to either a medical or surgical ward at the study hospital and their family carer will be invited to participate in the study. Both family carer and the care recipient must fulfil the inclusion criteria and provide informed consent to participate in the study. Eligible participants will be recruited via convenience sampling.

The family carers must be (i) an informal carer: not paid for the care they provide, and (ii) providing support for their care recipients, including personal care, in-home supervision, transport, and/or shopping, but do not have to live with the care recipient. The care recipient must be (i) aged 65 and above, (ii) admitted to a medical or surgical ward of the hospital, (iii) not wheelchair or bed-bound, and (iv) assessed on admission as having a risk of falling. Risk of falling is determined by answering 'yes' to any of the three falls' risk screening questions on the Patient Screening Assessment tool (including history of falls, use of walking aid, and urinary incontinence) in the Falls Risk Assessment and Management Plan (FRAMP) (Western Australian Department of Health, 2015). The care recipients will be excluded if they are (i) unable to communicate in English, (ii) assessed by the nurse manager or shift coordinator not to be medically stable, or (iii) received a score of 4 or more on the 4 'A's' Test (4AT), which is a rapid screening tool for cognitive impairment or delirium (Belletti et al., 2014). The four A's stand for alertness, abbreviated mental test, attention, and acute change.

4.3. Sample size

Sample-size calculation is based on the findings of Ang et al. (2020b) where the magnitude of difference in mean CFC-I scores between 102 carers looking after older people who had fallen in the past year (mean = 49.8, standard deviation (SD) = 16.2) and 39 carers looking after older people who did not fall (mean = 40.7, SD = 14.0) was moderate ($d = 0.60$) (Cohen, 1988). With this effect size, a total sample size of 90 family carers would achieve 80% power with a significance level of 0.05 using a two-tailed test (Soper, 2019). The researchers aimed to recruit a total of 180 family carers and care recipients as this will allow for a possible 50% attrition during follow-up.

4.4. Recruitment process

The recruitment and data collection process are documented in Fig. 1. The recruitment has commenced when the manuscript was submitted. During the recruitment phase, a research team member will find out from the nurse manager or shift coordinator if there are any patients who will be discharged from the wards within the next two days and are medically stable to participate in the survey. Before approaching the care recipient and their family carer, the researcher will check the 4AT score and nurses' fall risk assessment on FRAMP in the patients' medical record. Any care recipient with a 4AT score of 4 or more, which indicates cognitive impairment, or with no risk of falling, will be excluded from the study. The research team member will approach the nurse in-charge to administer the 4AT assessment if there is no 4AT score for the care recipient in the medical record. Potential participants will be provided with the participant information and consent form (PICF) for the patient. The PICF will cover the data collection details for the initial survey during 48 h before discharge and follow-up survey at 30 days post discharge. Written consent will be sought before conducting the initial survey and the participants will be asked to reconfirm their consent verbally during follow-up.

The researcher will inform the care recipient that they would like to contact their family carer regarding their interest to participate in the study. If the family carer is not present, the researcher will provide the care recipient with a copy of the PICF to give to their family carer. The family carer can then provide their contact details to the researcher if they choose to. If the family carer is available in the ward, the researcher will approach them regarding participating in the study. Written consent from the carer will be obtained in-person or verbal consent if the carer contacts the researcher by telephone. The PICF covers the data collection during 48 h before discharge, follow-up at one week, and 30 days post discharge.

4.5. Data collection methods

Data will be collected using an interviewer-administered survey conducted separately for family carer and their care recipient. The surveys will be conducted face-to-face (or over telephone for the carer) when the care recipient is at the hospital and via telephone after discharge. The family carer will complete the survey within 48 h before discharge, follow-up one week later, and 30 days after discharge. The care recipient will complete the survey within 48 h before discharge and 30 days after discharge.

4.5.1. Family carers' survey

Each survey for family carers will take 15–30 min to complete. The initial family carers' survey has 14 items collecting demographics data collected, including age, gender, marital status, employment status, relationship to patient, living arrangement, duration of caregiving, use of community services, and strategies to prevent the care recipient from falling. Fall history of the care recipient will be collected from the family carer, including number of previous falls in the past 12 months and worst injuries sustained from most recent falls. The family carer will be followed up on the frequency of falls, worst injuries sustained, and unplanned hospital readmission at one week and 30 days post discharge.

Carers' fall concern about the care recipient will be assessed using the CFC-I within 48 h before discharge, one week, and 30 days post discharge. The 16-item CFC-I assesses carers' concerns for the care recipient's health and function, living environment, and carers' perception of fall risk (Ang et al., 2020b). Each item is rated on a five-point Likert scale with '1' being 'not applicable/not at all concerned' and '5' being 'extremely concerned'.

Psychological distress experienced by family carers will be measured using the Kessler Psychological Distress Scale

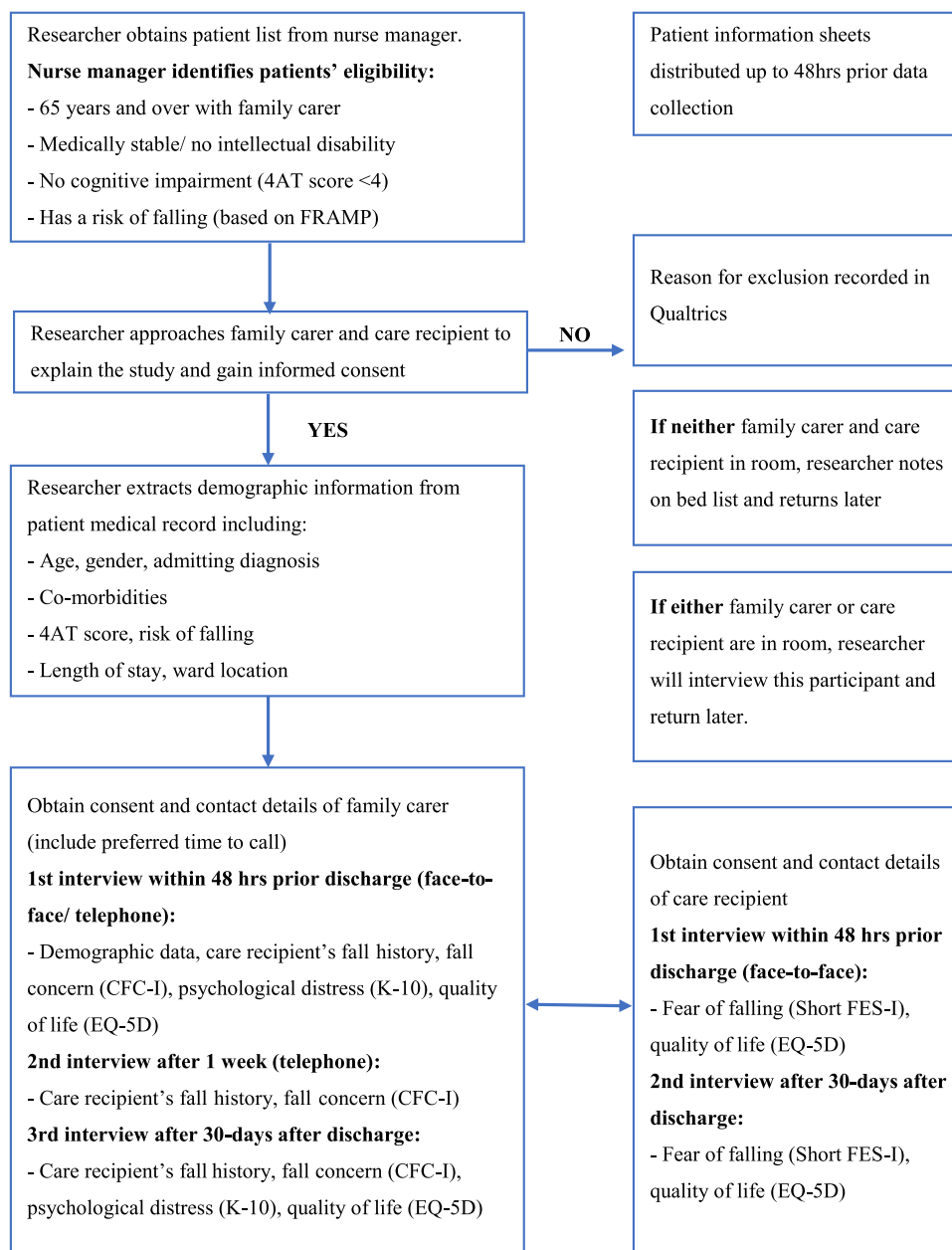


Fig. 1. Recruitment and data collection process.

(K10) (Andrews & Slade, 2001) within 48 h before discharge, and 30 days post discharge. The K10 is a 10-item questionnaire measuring anxiety and depression symptoms experienced over the last four weeks with higher scores indicating higher levels of psychological distress. The K10 reports good psychometric properties and has been widely used in Australian populations.

Quality of life of family carers will be assessed using the EQ-5D tool within 48 h prior discharge, and 30 days post discharge (EuroQol Research Foundation, 2020). The EQ-5D tool comprises of a descriptive component with five dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression, and a Visual Analogue Scale to determine self-reported health status of the participant at the time of completion. Each dimension is measured on five levels, including 'no problems', 'slight problems', 'moderate problems', 'severe problems', and 'extreme problems'. The Visual Analogue Scale will capture an overall rating of the participant's current health. The EQ-5D has been widely used on both general population and patients around the world and 15 studies reported

moderate effect sizes in response to improvements in health (Feng, Kohlmann, Janssen, & Buchholz, 2021).

4.5.2. Care recipients' survey

The care recipient's survey will take 15–30 min to complete. The initial care recipient's survey has eight items collecting demographic information from the patient's medical record, including age, gender, primary diagnosis on admission, co-morbidities, length of stay, ward location, and discipline. To determine the care recipient's eligibility for the study, information related to 4AT score and risk of falling using FRAMP will also be collected.

The care recipient's fear of falling is measured using the short Falls Efficacy Scale-International (FES-I) within 48 h before discharge and 30 days post discharge. The short FES-I consists of seven items measuring levels of concern about falling when performing activities inside and outside the home (Kempen et al., 2008). The instrument has excellent internal and test-retest reliability with Cronbach's alpha 0.92 and intra-class coefficient 0.83. Quality of life will be

assessed using EQ-5D within 48 h prior discharge and 30 days post discharge (EuroQol Research Foundation, 2020).

4.6. Data analysis

Data will be analysed using IBM SPSS Statistics (Version 28) predictive analytics software. Raw data will be entered and cross-checked with the hard copy to ensure there are no missing values and data are entered correctly. Descriptive statistics will be used to summarise the demographic data and outcome measures of family carers and care recipients. The relationship between carers' fall concern, psychological distress, quality of life, fear of falling, and frequency of falls will be analysed using inferential statistics. The validity and reliability of the CFC-I will be analysed using Cronbach's alpha, intra-class correlation, and Pearson's correlation.

5. Discussion

Older people are at increased risk of falling or sustaining fall injury after discharge (Hill et al., 2011). The National Safety and Quality Health Service Standards require health services to provide safe patient care, including fall prevention strategies, as part of the Comprehensive Care Standard (Australian Commission on Safety and Quality in Health Care, 2017). This includes partnering with patients, carers, and families in fall risk assessment, assessing risk, collaborative planning of care and fall prevention, and minimising harm from falls and post-fall management. Recent studies highlighted that most older people, including family carers, were unaware of their personal fall risk, do not think falls are a priority, or received information about fall prevention upon discharge (Hoffman, Shuman, Montie, Anderson, & Titler, 2019; Meyer et al., 2018). Healthcare professionals in acute care services are well-placed to provide support for family carers, particularly about their roles in fall prevention and provision of care for older people after discharge.

Previous research mainly focused on older peoples' experiences of falls such as fear of falling. This study will address an important gap in the literature by providing insight into the psychological impact of caring for older people without cognitive impairment at risk of falling based on the level of fall concern and to enable tailored fall prevention education for family carer in assessing and managing their care recipient's fall risks at home. The prospective study will allow healthcare professionals to determine if carers' fall concern is sensitive to the frequency of falls among older people during follow-up.

In addition, the longitudinal design will also allow healthcare professionals to determine the relationship between fall concern and other health variables such as psychological distress, quality of life, and fear of falling among family carers and their care recipients during hospitalisation and after discharge. Preliminary analysis in the previous cross-sectional study only established validity and reliability of the instrument on family carers looking after general population of older people (Ang et al., 2020b). The results of this prospective study will further validate the use of CFC-I among family carers of older people without cognitive impairment being assessed with a risk of falling. The association between carers' fall concern and other important psychosocial health variables could serve as an intervention point for healthcare professionals to provide education, skills training, and support for carers to help them more effectively manage or prevent their care recipients from falling at home.

There are several limitations that may limit the generalisability of the study findings. First, the study excludes family carers of older people with cognitive impairment. It is unlikely that the participants would be representative of all family carers and older people admitted to the hospital during the study period. Between 2020 and 2021, there were about 25,500 hospitalisations due to dementia that accounted for every 2 out of 1000 hospitalisations in Australia

(Australian Institute of Health and Welfare, 2023). However, this study aimed to determine the association between carers' fall concern and older people's fear of falling that is an important fall risk factor and determinant of poorer mobility and functional outcomes (Auais et al., 2018; Denking, Lukas, Nikolaus, & Hauer, 2015). Only care recipients who can participate in the interviewer-administered survey will be recruited. Second, the study did not include family carers of older people who are bed-bound or unable to mobilise without assistance. The CFC-I was developed for family carers looking after older people who were living independently at home. Some questions involved asking the family carers for their concern when the care recipients undertake their activities of daily living. However, this quantitative study will provide a unique insight into the fall concern of family carers looking after older people following discharge from the hospital where the care recipients are most vulnerable to fall (Davenport et al., 2009). Third, it is anticipated that there will be high attrition and low adherence to the follow-up survey among family carers due to high levels of commitment and stress in their caring role. To manage potential high drop-out rates, participants will be provided with periodic text messaging reminders and the surveys are designed to take a minimal amount of time to complete. In addition, the study will also recruit family carers and older people from both medical and surgical wards to achieve the sample size required. We acknowledged that this could result in two different cohorts of patients with different fall risks as a potential limitation.

6. Conclusion

Family carers are well-recognised as essential in preventing older people living in the community from falling, however, the concept of measuring carers' concern about the care recipient's risk of falling is relatively new. A 16-item multi-factor instrument was developed to measure carer's fall concern. This protocol paper describes the first prospective study to explore the relationship of fall concern, psychological health, and quality of life of family carers when the care recipient is hospitalised and after discharge. Findings from this study will provide deeper understanding of the factors associated with fall concern among family carers and their older people after discharge from hospital. This will enable healthcare professionals to assess and identify factors that could affect family carers when trying to prevent falls and tailor interventions to fit the carers' needs.

Authorship contribution statement

The authors declare the following contributions as per the CRediT guidelines. Conceptualisation and methodology: Seng Giap Marcus Ang, Rosemary Saunders, Charlotte Foskett, Chiew Jiat Rosalind Siah, Christopher Etherton-Ber, Karen Gullick, Sue Haydon, and Amanda Wilson. Writing – original draft: Seng Giap Marcus Ang, and Rosemary Saunders. Writing – review and editing: Seng Giap Marcus Ang, Rosemary Saunders, Charlotte Foskett, Chiew Jiat Rosalind Siah, Christopher Etherton-Ber, Karen Gullick, Sue Haydon, Melissa Dunham, Nicolette Sagaram, Rhea Rodriguez Tecson, and Amanda Wilson.

Funding

Seng Giap Marcus Ang is funded through Ramsay Healthcare sponsorship by Ramsay Health Care Australia Pty Ltd Grant, 2021–2023.

Ethical statement

This study protocol was reviewed and approved by the Ramsay Health Care WA/SA Human Research Ethics Committee (HREC

2129W) on 20 September 2021 and Edith Cowan University Human Research Ethics Committee (2021-02933-ANG) on 8 October 2021. In addition, the study has also received the research governance approval from Hollywood Private Hospital (RHC RG – 2021.147) on 21 October 2021.

Conflict of interest

No conflict of interest has been declared by the authors.

References

- Abendroth, M., Lutz, B. J., & Young, M. E. (2012). Family caregivers' decision process to institutionalize persons with Parkinson's disease: a grounded theory study. *International Journal of Nursing Studies*, 49, 445–454. <https://doi.org/10.1016/j.ijnurstu.2011.10.003>
- Andrews, G., & Slade, T. (2001). Interpreting scores on the Kessler Psychological Distress Scale (K10). *Australian and New Zealand Journal of Public Health*, 25, 494–497. <https://doi.org/10.1111/j.1467-842X.2001.tb00310.x>
- Ang, S. G. M., O'Brien, A. P., & Wilson, A. (2020a). Carers' concern for older people falling at home: an integrative review. *Singapore Medical Journal*, 61, 272–280. <https://doi.org/10.11622/smedj.2019142>
- Ang, S. G. M., O'Brien, A. P., & Wilson, A. (2020b). Investigating the psychometric properties of the Carers' Fall Concern Instrument to measure carers' concern for older people at risk of falling at home: a cross-sectional study. *International Journal of Older People Nursing*, 15, Article e12338. <https://doi.org/10.1111/ohn.12338>
- Auais, M., French, S., Alvarado, B., Pirkle, C., Belanger, E., & Guralnik, J. (2018). Fear of falling predicts incidence of functional disability 2 years later: a perspective from an international cohort study. *The Journals of Gerontology: Series A*, 73, 1212–1215. <https://doi.org/10.1093/geron/glx237>
- Australian Commission on Safety and Quality in Health Care (2017). *National Safety and Quality Health Service Standards* (2nd edn). (<https://www.safetyandquality.gov.au/sites/default/files/migrated/National-Safety-and-Quality-Health-Service-Standards-second-edition.pdf>).
- Australian Institute of Health and Welfare (2022). *Injury in Australia: Falls*. (<https://www.aihw.gov.au/reports/injury/falls>).
- Australian Institute of Health and Welfare (2023). *Dementia in Australia*. (<https://www.aihw.gov.au/reports/dementia/dementia-in-aus/contents/health-services-used-by-people-with-dementia/hospital-care>).
- Bellelli, G., Morandi, A., Davis, D. H., Mazzola, P., Turco, R., Gentile, S., et al. (2014). Validation of the 4AT, a new instrument for rapid delirium screening: a study in 234 hospitalised older people. *Age and Ageing*, 43, 496–502. <https://doi.org/10.1093/ageing/afu021>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd edn). Lawrence Erlbaum Associates (<http://ebookcentral.proquest.com/lib/newcastle/detail.action?docID=1192162>).
- Cumming, R. G., Salkeld, G., Thomas, M., & Szonyi, G. (2000). Prospective study of the impact of fear of falling on activities of daily living, SF-36 scores, and nursing home admission. *The Journals of Gerontology: Series A*, 55, M299–M305. <https://doi.org/10.1093/gerona/55.5.M299>
- Davenport, R. D., Vaidean, G. D., Jones, C. B., Chandler, A. M., Kessler, L. A., Mion, L. C., et al. (2009). Falls following discharge after an in-hospital fall. *BMC Geriatrics*, 9(53), <https://doi.org/10.1186/1471-2318-9-53>
- Denkinger, M. D., Lukas, A., Nikolaus, T., & Hauer, K. (2015). Factors associated with fear of falling and associated activity restriction in community-dwelling older adults: a systematic review. *The American Journal of Geriatric Psychiatry*, 23, 72–86. <https://doi.org/10.1016/j.jagp.2014.03.002>
- Dever Fitzgerald, T. G., Hadjistavropoulos, T., & MacNab, Y. C. (2009). Caregiver fear of falling and functional ability among seniors residing in long-term care facilities. *Gerontology*, 55, 460–467. <https://doi.org/10.1159/000221007>
- DeVon, H. A., Block, M. E., Moyle-Wright, P., Ernst, D. M., Hayden, S. J., Lazzara, D. J., et al. (2007). A psychometric toolbox for testing validity and reliability. *Journal of Nursing Scholarship*, 39, 155–164. <https://doi.org/10.1111/j.1547-5069.2007.00161.x>
- Dow, B., Meyer, C., Moore, K. J., & Hill, K. D. (2013). The impact of care recipient falls on caregivers. *Australian Health Review*, 37, 152–157. <https://doi.org/10.1071/AH12168>
- EuroQol Research Foundation (2020). *EQ-5D-5L About*. (<https://euroqol.org/eq-5d-instruments/eq-5d-5l-about/>).
- Feng, Y. S., Kohlmann, T., Janssen, M. F., & Buchholz, I. (2021). Psychometric properties of the EQ-5D-5L: a systematic review of the literature. *Quality of Life Research*, 30, 647–673. <https://doi.org/10.1007/s11136-020-02688-y>
- Gazibara, T., Kurtagic, I., Kiscic-Tepavcevic, D., Nurkovic, S., Kovacevic, N., Gazibara, T., et al. (2017). Falls, risk factors and fear of falling among persons older than 65 years of age. *Psychogeriatrics*, 17, 215–223. <https://doi.org/10.1111/psyg.12217>
- Hill, A. M., Hoffmann, T., McPhail, S., Beer, C., Hill, K. D., Oliver, D., et al. (2011). Evaluation of the sustained effect of inpatient falls prevention education and predictors of falls after hospital discharge—follow-up to a randomized controlled trial. *The Journals of Gerontology: Series A*, 66, 1001–1012. <https://doi.org/10.1093/geron/glr085>
- Hoffman, G. J., Shuman, C. J., Montie, M., Anderson, C. A., & Titler, M. G. (2019). Caregivers' views of older adult fall risk and prevention during hospital-to-home transitions. *Applied Nursing Research*, 47, 10–15. <https://doi.org/10.1016/j.apnr.2019.03.006>
- Honaker, J. A., & Kretschmer, L. W. (2014). Impact of fear of falling for patients and caregivers: perceptions before and after participation in vestibular and balance rehabilitation therapy. *American Journal of Audiology*, 23, 20–33. [https://doi.org/10.1044/1059-0889\(2013\)12-0074](https://doi.org/10.1044/1059-0889(2013)12-0074)
- Hughes, C. C., Kneebone, I. L., Jones, F., & Brady, B. (2015). A theoretical and empirical review of psychological factors associated with falls-related psychological concerns in community-dwelling older people. *International Psychogeriatrics*, 27, 1071–1087. <https://doi.org/10.1017/s1041610214002701>
- Kempen, G. I., Yardley, L., van Haastregt, J. C., Zijlstra, G. A., Beyer, N., Hauer, K., et al. (2008). The Short FES-I: a shortened version of the falls efficacy scale-international to assess fear of falling. *Age and Ageing*, 37, 45–50. <https://doi.org/10.1093/ageing/afm157>
- Kuzuya, M., Masuda, Y., Hirakawa, Y., Iwata, M., Enoki, H., Hasegawa, J., et al. (2006). Falls of the elderly are associated with burden of caregivers in the community. *International Journal of Geriatric Psychiatry*, 21, 740–745. <https://doi.org/10.1002/gps.1554>
- Lees, C., O'Brien, T., & Maganaris, C. (2021). A mirror image: experiences of informal carers caring for frail, older persons at risk from falling. *British Journal of Community Nursing*, 26, 64–68. <https://doi.org/10.12968/bjcn.2021.26.2.64>
- Leggett, A. N., Polenick, C. A., Maust, D. T., & Kales, H. C. (2018). Falls and hospitalisations among persons with dementia and associated caregiver emotional difficulties. *The Gerontologist*, 58, e78–e86. <https://doi.org/10.1093/geront/gnx202>
- Meyer, C., Renehan, E., Batchelor, F., Said, C., Haines, T., Elliott, R., et al. (2018). 'Falls not a priority': insights on discharging older people, admitted to hospital for a fall, back to the community. *Australian Journal of Primary Health*, 24, 66–73. <https://doi.org/10.1071/py17052>
- Soper, D.S. (2019). *A-priori Sample Size Calculator for Student t-Tests*. [Software]. (<https://www.danielsooper.com/statcalc/calculator.aspx?id=47>).
- Western Australian Department of Health (2015). *Development of Falls Risk Assessment and Management Plan*. (<https://ww2.health.wa.gov.au/~media/Files/Corporate/general-documents/falls/PDF/Dev-of-FRAMP.pdf>).
- Wilkinson, A., Meikle, N., Law, P., Yong, H. J., Butler, P., Kim, J., et al. (2018). How older adults and their informal carers prevent falls: an integrative review of the literature. *International Journal of Nursing Studies*, 82, 13–19. <https://doi.org/10.1016/j.ijnurstu.2018.03.002>
- World Health Organisation (2007). *WHO Global Report on Falls Prevention in Older Age*. (http://www.who.int/ageing/publications/Falls_prevention7March.pdf).
- World Health Organisation (2018). *Falls*. (<https://www.who.int/news-room/factsheets/detail/falls>).