

Knowledge, Attitude, Practice on Fall Prevention among Informal Caregivers of Older Person with Dementia – A Scoping Review

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Abstract

Background: Falls are a significant cause of morbidity and mortality in older people with dementia due to declining physical and cognitive abilities, exposing to high fall risk. Informal Caregivers play a crucial role in fall prevention care and their knowledge, attitudes, and practices regarding fall prevention are vital for reducing fall risks. Evaluating caregivers' knowledge, attitudes, and practices in fall prevention benefits overall care for the recipients.

Objective: To identify knowledge, attitudes and practices of informal Caregivers on fall prevention among older person with Dementia and the instruments used to access it.

Methods: The Arksey and O'Malley (2005) framework for scoping reviews (PRISMA-ScR) guidelines was adapted. Three databases were included in the search for articles from 2013 to 2023. Two independent reviewers conducted study selection, article screening and data extraction. Extracted data summarised according to study aim.

Results: Among the 280 analysed articles, only five were relevant to our review. Five articles assessed knowledge, four assessed attitude, and three included practices related to fall prevention. However, none of the articles reported the exact instruments used for assessing knowledge, attitude, and practice. **Conclusion:** Key findings indicate low knowledge on fall prevention among Informal Caregivers, although they hold a positive attitude. There is a lack of practice and a multidomain approach to fall prevention. Professional references are limited, and no valid instrument to assess caregivers' knowledge, attitude and practice in preventing falls among older persons with dementia. **Recommendation:** Future research should focus on psychoeducation in fall prevention involving Informal Caregivers and a multidomain approach. Developing a valid instrument is essential for evaluating intervention effectiveness.

Keyword: Informal caregiver, Older Person, Dementia, Fall Prevention, Knowledge, Attitude, Practice

Introduction

The main challenges that Older Person (OP) person experience are impairments associated to decreased functional abilities (Rivan et al., 2019). These age-related functional reductions are closely associated with both physical and cognitive abnormalities (Murman, 2015), such as those seen remarkably in dementia (Arvanitakis et al., 2019). It is critical to retain strong functional ability, cognitive function and fewer age-related issues parallel to aging (Murman, 2015).

In the coming decades, the burden of Alzheimer's disease and related dementias (ADRDs) is expected to rise rapidly due to population ageing, particularly in low- and middle-income countries (Nandi et al., 2022), including Malaysia. It is estimated that 8.5% of older person living in Malaysia, or approximately 260 000 people, have dementia. Preparations in combating these aging related challenges is crucial at present, later and also down the years (Rudnicka et al., 2020).

Among Older Person with Dementia (OPWD), falls are a leading cause of morbidity and mortality (R. Sun et al., n.d.). Human body is inherently unstable, because the complex regulatory mechanisms require to keep the body upright and prevent falls. These mechanisms begin to fail with normal ageing (Reimann et al., 2020). When compared to age- and gender-matched controls, patients with dementia have much greater than expected impairments leading to falls, and these impairments are more pronounced in patients with dementia who already had a fall (Singh et al., 2021). The annual incidence of falls in patients with dementia is two times the rate to cognitively normal elderly population. Serious injury is more common, with one-quarter of dementia patients who fall suffering from a fracture (Dev et al., 2021). Furthermore, dementia patients who fall, have a worse prognosis than cognitively normal elderly fallers. They are less likely to be able to recover satisfactorily from injury (Lim et al., 2014), they are more probable to be institutionalized, and have a 6-month mortality rate after fracture neck of femur—more than three times that of cognitively intact patients (Friedman et al., 2010).

Controlling the intrinsic (unstable joint, pain, muscle weakness, balance, vision impairments, unsteady gait, postural hypotension, and many more) and extrinsic fall factors (environmental hazards such as incorrect walking aids, poor lighting, poor furniture arrangements, pets, rugs, and many more) helps preventing falls (Fernando et al., 2017). In all probability, due to the nature of the Dementia disease, OPWD have poor understanding on comprehending and controlling fall risk factors on their own. The ability of OPWD to self-screen fall risk and self-manage fall risk factors no feasible owing to the disease's nature makes most knowledge translation fall interventions unsuccessful. An approach through Informal Carer Givers (ICG) is known to be more successful in any fall prevention (Bailes et al., 2016).

Falls and dementia are often treated as separate illnesses. These conditions, however, frequently co-occur and one may precede the other (Shaw, 2007). Despite the fact that a considerable body of research has been conducted to characterize the factors of falls among OPWD and the falls prevention among these vulnerable populations (Fernando et al., 2017), lesser are conducted through the ICG (Sun et al., n.d.). Anyhow, studies have reported that, ICG are facing numerous challenges in fall prevention care for OPWD attributable to disparities in Knowledge, Attitude and Practice (Bailes et al., 2016; Ferreira-Valente et al., 2011; Sultana et al., 2023).

As far as fall prevention care for the OP is concerned, knowledge is an essential component (Ong et al., 2021). Fall occurrences are accidental and often without preparation and for an unforeseeable time. According to studies, many carers lack the necessary skills and expertise to appropriately care for the persons they support, relying on experiences, observations, and orientations from professionals or close friends, as well as intuition and beliefs (Mamani et al., 2019). Such sudden occurrence requires huge amount of information's to manage the overall situations. This wasn't exemplified in a mixed-method systematic review by (Zhou et al., 2021), where findings were contradicted. The new insight in understanding ICG and responses to fall risk on OPWD literally was 51%, accounting more than half people has good knowledge on fall prevention and fall management. Anyhow, author also identified the percentage as significant gaps in knowledge and suggested examining the perspective of ICG is essential in future interventions to reduce negative impact on caregivers and care systems in fall prevention.

Despite having good knowledge, switching perceptions into positive attitude and translating knowledge into practice is key of any fall prevention managements (Mamani et al., 2019). The evidence presented thus far supports the idea by Ong et al., (2021), that fall risk reduction is based not only on delivering knowledge, but also having a favorable attitude and also a frequent practice. These evidences are also significantly reflected among ICG fall prevention interventions. In contrast to earlier findings, however, among United Kingdom population of 20 OPWD dyads concluded, how people with cognitive impairment and their relatives perceive fall risk and prevention, mirrors findings from a larger cohort of older people without dementia. Participants had negative attitude towards fall prevention and believed that were now not relevant to them (Peach et al., 2017). Knowledge translation into attitude and practice is very important for a successful fall prevention care among OP (Zhang et al., 2012), somehow, to our knowledge, the KAP level among ICG is considerably uncertain as there are very limited studies carried out to determine the needs for fall prevention through ICG for OPWD. Researchers are unable to conduct studies as the literatures remains hugely limited and less congregated. This limits the possibilities to expand the current and future research in this field of study. Adequate KAP on fall prevention is essential for a good quality of care which impact overall patient outcomes. Therefore, this study has aimed to carry out a scoping review to identify the level of KAP among ICG of OPWD on fall prevention and also to determine the available studies related to this topic of research. This study synthesizes findings and looks into the strength pertaining this topic and provide a comprehensive summary through critical evaluation of the current literatures. It stretches the body of knowledge concerning needs for empowering KAP among ICG of OPWD for any form of fall prevention intervention or educational trainings. The method adapted in this study fills the literature gaps that needed for informing updates on ICG disparities in KAP which need empowerment for successful fall prevention managements.

Literature Review

Studies have found that a large population of carers lacked the knowledge and abilities necessary to provide for the PwD assisted. Lack of knowledge, practice, and information requirements have disastrous repercussions for both older individuals and family carers. This finding is consistent with findings from earlier studies in which informal senior carers' understanding of fall prevention towards dementia patients was minimal (Tsolaki et al., 2008) and superficial (Cations et al., 2018). This is probably because most of the carers began their roles lately, unprepared, and as a result of how this knowledge was learned. One of the key

sources of information concerning falls is personal experience, which people might learn from their interactions with older people who have fallen or from other experiences. Nowadays, media may be accessed at any time and from any location, allowing carers to learn about health problems, treatments, and prevention methods.

Previous studies that found a generally unsatisfactory knowledge of dementia in informal carers (Lüdecke et al., 2016; Robinson, 2015) similarly found a low dementia knowledge level. A caregiver's knowledge of medical issues and how they provide care for patients may be impacted by their superficial understanding (Lüdecke et al., 2016). In relation to elders' falls, this level of knowledge may lead carers to adopt or implement a few practices correctly. Effective fall prevention in the elderly at home necessitates more extensive knowledge, which includes the unique changes of aging as well as the causes and effects of falls, as well as the required actions to prevent them. Carers must improve their knowledge in both quantity and quality in order to appropriately care for the elderly, resulting in favourable impacts in the avoidance of falls. Besides, ICG frequently feel unprepared and have low knowledge to provide adequate care to dementia patients and receive little advice from healthcare experts (S. Fernando, 2019). ICG may be unfamiliar with the sort of care, or the amount of care required due to a low of knowledge and skill. Additionally, family carers might not be aware of their need for community services or how to access and effectively use those that are already accessible (Towle et al., 2019). As a result, ICG' express feelings of confusion, emotional anguish, and a need for supplementary knowledge (Moon, 2017). Improving knowledge and practice, as well as supporting the needs of ICG, should be the highest priority. In a different study, Avila et al., (2015) investigated the amount of informal carers' knowledge of fall prevention toward PwD. They discovered that only 42.7% of family carers had this knowledge, and less than half of the participants (48.3%) thought it was possible to prevent falls in the elderly. However, research by Mamani et al., (2019) on family carers' understanding of falls and how to prevent them found that more than half of them (53.6%) recognized falls as a concern. In a few research, the level of knowledge increases or is high when informal carers have more awareness (Scott et al., 2018), a better understanding of the dementia patient (Abdollahpour, 2018), and would like to seek the help of care providers. Studies that concentrated on dementia knowledge have already demonstrated the gap in informal carers' knowledge of dementia-related topics (Liu et al., 2019).

According to a study on fall, prevention practices among dementia patients conducted by ICG in Brazil, practically all of them (99.0%) acknowledged using it in their everyday care (Mamani et al., 2019). The main preventive strategies stated and related to the behaviour of the elderly were alertness (57.7%), walking with caution (18.6%), and activity restriction (12.4%). Additionally, carers' environmental fall prevention strategies included avoiding wet or loose mats in the home (23.7%), avoiding loose mats in the house (28.9%), and placing support bars in bathrooms and other places (12.4%). These family carers, according to the authors, had a cursory understanding of falls and how to prevent them, which appeared to have an impact on how they went about doing so (Perrotta et al., 2020). In Cameroon, family carers who were asked about their routines for caring for dementia people at home primarily mentioned helping elderly relatives with activities of daily living. However, some of these family members also admitted to performing some highly skilled healthcare duties, including giving their elderly relatives their medicines (14.3%). This study also demonstrated the inadequate fall prevention practices among family carers, with a sizable proportion (55.6%) of the carers reported not making their houses age friendly (M. J. Zawadzki et al., 2022). The authors

concluded that teaching dementia people's family carers in Cameroon how to avoid falls was necessary.

In Zhejiang Province, ICG' knowledge about PwD had a favourable impact on practices related fall prevention care. As a result, it was challenging for caregivers to deliver high-quality geriatric care without the necessary understanding. Pre-employment training had a positive impact on ICG practice according to one study. ICG practice benefited from on-the-job training periods as well. These findings, which are consistent with earlier study, emphasize the value of ongoing training for caregivers (ENGSTRÖM et al., 2011; Feng et al., 2012; Song et al., 2014). A middle school graduation and at least 180 hours of training were the minimum criteria for elderly caretakers in China, according to the "National Occupational Standards for Old-Age Caregivers" promulgated in 2002.

The highest frequency of practice in fall prevention of PwD among ICG in United States also explained in activity restriction. In order to be eligible to work in nursing homes recognized by Medicaid and Medicare, all American caregivers are required to complete 75 hours of training, according to federal law (Tyler et al., 2010). Germany also illustrates higher frequency of practice and demands 50% of the ICG be registered with a minimum of three years of geriatric training (Colombo & Mercier, 2012). The Organization for Economic Co-operation and Development (OECD) has shown that training and credentials are crucial factors in determining a healthcare quality.

Balbim et al., (2019) demonstrates 11 coping strategies as a practice applied from the ICG towards PwD. ICG reported highest frequency in terms of avoidance, keeping busy, spirituality, self-care, rationalization, social interactions, physical activity, leisure activities, mobilizing resources, additional wellness activities such as health eating family time, and healthcare visits. Meanwhile (Anderson et al., 2019) mentioned ICG applied 8 types of practice in avoiding fall prevention among PwD. Firstly, health and wellness; ICG are aware of the issues, difficulties, unique solutions, and personal time. Secondly, altruism; donating and spreading the word, provides a sense of purpose that improves wellbeing and aids in stress management. Thirdly, reminiscing and legacy building; a self-care and respite method to cope with stressful times. ICG take some time to recall of their diagnosis. Then information exchange; a method of taking care of oneself that involves gathering knowledge and resources. reduces caregiver stress by encouraging self-care and creating a network for engagement. Fifthly, organization and planning; a method of prioritizing elderly own needs. Following by spirituality; self-care technique for coping and times of meditation or prayer. Undoubtedly, social support also important when ICG wanted housekeeping help, outside caregiver aid, and training in resilience development in addition to respite and support from organizations and support groups. Self-care activities for stress management and wellness also highest in practiced. This included following doctor's orders about medicine, using napping, exercising, maintaining a good diet, and engaging in spiritual traditions.

In research that included participants from 22 nations, 55% of respondents said that geriatric care practice was not regarded as a primary speciality in their nation (Pitkälä et al., 2018). According to 23% of research participants in a survey of 55 ICG in Belgium, the level of practice of PwD from inadequate to fair (Piers et al., 2019). Similar to this, application of practice by ICG, more than 74% of healthcare providers in Uganda do not frequently use the recommended care mode (Daniel et al., 2021). According to research from Slovakia, Bangladesh, and Uganda, inadequate knowledge was found to be substantially correlated with levels of training, education, and experience (Daniel et al., 2021; Mahmud et al., 2020). However, this is not adequate (Amsalu et al., 2021; Fita et al., 2021). In Ethiopia, changes have

been made to the informal caregiver curriculum and training on some age-related disorders. Continued education and curriculum on the quality of care are required to improve ICG practice in the care of the elderly (Eloranta et al., 2014).

Little is currently known about the elements that may have a positive or negative impact on the caregiver's attitude toward dementia patient especially in fall prevention (Teichmann et al., 2022). According to studies from Iran, Slovakia, and Australia, more than half of ICG had a negative view regarding fall prevention management (Kabatova et al., 2016; Mansouri Arani et al., 2017). According to earlier studies, carers frequently deal with a variety of difficulties, such as poor behavioural and psychological issues with PwD (Yuan et al., 2021), a negative perception of helping with PwD's daily tasks (Zenker et al., 2017), and social isolation from working long hours as carers. These elements may have unfavourable effects on carers, including a heavy load of caregiving or probable depression (Sallim et al., 2015). There were significant gaps in ICG' attitudes in Africa. According to studies from Zanzibar and Egypt, 42% to 93.3% of informal caregiver's had a negative attitude toward the treatment of fall preventions (Muhsin, 2019; Rush et al., 2017). Studies in Ethiopia revealed that 54.3% to 78.1% of ICG had an unfavourable attitude toward the patients who need fall prevention management (Fita et al., 2021; Rush et al., 2017). According to many research, ICG negatively attitude on the fall prevention treatment were influenced by their age, living with family members, sex, and marital status (Mansouri Arani et al., 2017; NILSSON et al., 2012; Özdemir & Bilgili, 2016). Additional variables that were discovered to affect negatives attitudes of ICG included their degree of education, experience, learning institutions, and working units (NILSSON et al., 2012). ICG' knowledge and attitudes were closely related to how well caregivers cared for elderly patients, according to a study from China (Fita et al., 2021). Other elements that affect how elderly patients are cared for by nurses include their level of education, experience, and training.

However, previous research discovered that informal carers had a consistently positive attitude toward fall prevention (L. Zawadzki et al., 2011). A study evaluated the attitude and the parameters between carers who participated in a psycho-education program for carers as a secondary outcome (Karagkiozi, 2017) and others who have never participated in such a program. A substantially more positive attitude towards falls prevention significantly greater dementia knowledge, and significantly higher confidence in dementia care. The psychoeducation program's participants demonstrated that they tended to focus more on the advantages of providing care. Participants in the study also experienced significantly less anxiety both as a trait and as a state, indicating a marginally higher burden of care.

The overall positive attitude was also observed by previous studies that showed a generally positive attitude toward fall prevention of elderly (Chiao et al., 2015). Studies that demonstrate a positive attitude are highlighted, and this conclusion emphasizes the notion that education and psychological support can have an impact on attitude (Lampe et al., 2023). In parallel to other studies, informal carers felt more positive aspects of caregiving (Abdollahpour, 2018). Kim et al., (2017) who investigated a dementia family support program had a statistically negligible positive impact on carers' attitudes towards fall prevention. In general, confidence is correlated with knowledge since knowledgeable carers are anticipated to feel confident and eager to impart their expertise (Gkioka et al., 2020) therefore, as suggested by earlier studies, there is also a link between a positive outlook and less anxiety. One of the coping mechanisms that might lessen the effects of caregiving pressures is focusing on the positive attitude of providing care (Yu et al., 2018). In a prior study of dementia informal carers, it was shown that there was a significant inverse association

between the positive attitude of caregiving and carer burden (Quinn et al., 2019). Another longitudinal study revealed a connection between the positive attitude of caring and carer well-being. More precisely, studies have shown that carers' self-efficacy is one of the resilience elements for their health outcomes and a significant contributor to the positive attitude toward caregiving (Semiatin, 2012). There are various categories of good characteristics of caregiving among informal carers of PwD. Role satisfaction, emotional benefits, personal growth, competence and mastery, interpersonal gains, sense of duty, and reciprocity were some of the important themes identified by a study of the literature of qualitative research exploring the positive attitude of ICG (Lloyd et al., 2014). Four primary dimensions were found in a more recent analysis of the positive attitudes of caregiving: a sense of personal progress and fulfilment, feelings of reciprocity in a dyadic connection, an increase in family cohesion and functionality, and a sense of personal growth and purpose in life (Yu et al., 2018).

For these reasons, we conducted a scoping review in order to identify gaps in current research by reviewing and summarizing numerous sources of data from various literatures. This study provides insight into the investigated topic, as the findings are valuable for researchers and health care workers in collaborating on evidence-based results for a successful fall prevention intervention through ICG for OPWD. The findings also contribute to the development of a valid and reliable KAP instrument to assess the baseline of ICG on fall prevention.

Methodology

Protocol

This scoping review included frameworks developed by Arksey and O'Malley, Joanna Briggs Institute and Preferred Reporting Items for Systematic Reviews and Meta-analysis Extensions for Scoping Reviews (PRISMA-ScR) (Arksey & O'Malley, 2005). It was adapted to summarize the study area of interest and chosen to accommodate the review on wide range of literatures inclusive of methodological and geographical perspective to understand the KAP on fall prevention among ICG of OPWD.

Research question

General research question was "What are the current literature findings on KAP of ICG of OPWD on fall prevention"? Specific questions were: (i) What is the KAP on fall prevention among ICG of OPWD? (ii) What are the instruments used to evaluate the KAP of ICG of OPWD in fall prevention?

Identifying relevant studies

Identifying keywords

This scoping review adapts PCC framework to guide and constructs a meaningful and clear study objective. It was also used to identify the keywords for a reliable search strategy.

Table 1

Keywords identification using PCC framework

Population	ICG of OPWD
Concept	Knowledge, Attitude and Practice
Context	Fall Prevention

Eligibility criteria

Article selection was adapted with broad set of inclusion criteria to assure selection of relevant article by the principal investigator and the research team. We select articles based on; (a) all type of dementia, (b) focusing on ICG of older person defined as those aged 60 years old and above with dementia, (c) studies related to fall prevention among OPWD involving ICG with outcomes assessing KAP, (d) KAP outcomes can be the primary study objectives or any component of a major studies, (e) studies inclusive observational, intervention, cross sectional, all form of reviews and pilot study. All article has to be in English language, full text and also published within 10 years (from 2013 to June 2023). Studies were excluded if it was not meeting the above criterions. Conference publications, thesis, grey literatures, abstracts, poster presentations and studies involving institutionalized and hospitalized OPWD were also excluded. Studies involving fall prevention in hospital inpatient settings were also excluded.

Data Sources And Search Strategy

Three electronic databases were searched include; PubMed Central (PMC), Medline and CINAHL. Published articles are within 10 years (from 2013 to 2023) as the fall prevention among OPWD and studied among ICG are the emerging topic. The search was conducted with all possible combinations in the search algorithm (Refer table 2). We used Mendeley as reference management software to identify duplicate articles. All searches in database were carried out between April and May 2023.

Table 2

Search Algorithm for each database

Database	Search Algorithm
PMC	(((((informal care giver) AND (((older person*') OR elderly) OR older adult*')) AND ((((((dementia) OR frontotemporal dementia) OR lewy body dementia) OR vascular dementia) OR parkinson disease dementia) OR mixed dementia))) AND (((fall prevention*') OR reduce risk of fall*') OR fall management*')) AND (((knowledge) OR awareness))) AND ((practice *') OR action)) AND (((attitude) OR point of view))
CINAHL	(((((informal care giver) AND (((older person*') OR elderly) OR older adult*')) AND ((((((dementia) OR frontotemporal dementia) OR lewy body dementia) OR vascular dementia) OR parkinson disease dementia) OR mixed dementia))) AND (((fall prevention*') OR reduce risk of fall*') OR fall management*')) AND (((knowledge) OR awareness))) AND ((practice *') OR action)) AND (((attitude) OR point of view))
Medline	(((((informal care giver) AND (((older person*') OR elderly) OR older adult*')) AND ((((((dementia) OR frontotemporal dementia) OR lewy body dementia) OR vascular dementia) OR parkinson disease dementia) OR mixed dementia))) AND (((fall prevention*') OR reduce risk of fall*') OR fall management*')) AND (((knowledge) OR awareness))) AND ((practice *') OR action)) AND (((attitude) OR point of view))

Review Process

Two authors conducted the preliminary search for all three databases. Each article was reviewed by title, abstracts and full text. Final selection of article is made after discussion of discrepancies between principal investigator and other authors. First, after a broad search of articles, removal of duplicate was conducted using Mendeley Reference Manager. The title and abstract of the related articles were screened by the principal reviewer. After the initial screening, two authors (SN & AA) including the principal investigator screen article for eligibility criteria and followed by full-text article reviews. The summary of results was presented to other members of the research team in order to reach a consensus and discuss disagreements. The flow of review and its screening processes is clearly reported in Prisma Flow Diagram (Flow chart 1).

Data Charting

Data extraction charting was carried out and charted into a table in an excel document. Collected data inclusive of published author, year of publication, country where the study conducted, study design and method, population being studied (population of country studied), sample size, type and level of dementia, and outcomes. Findings across all reviewed studies were extracted and synthesized using four main outcomes; Knowledge, Attitude, Practice on Fall prevention among ICG and Instrument used to access it. The final outcome is reported in the summary table 3 (Appendix 1).

Result synthesis

The summary of extracted results was segmented thematically. Studies were group into Author, Year, Study design/Method, Population (Country)/Sample, Type of Dementia and Outcomes. Systematic reviews article was added to this scoping review to summarise the highest-level of evidence in current literature.

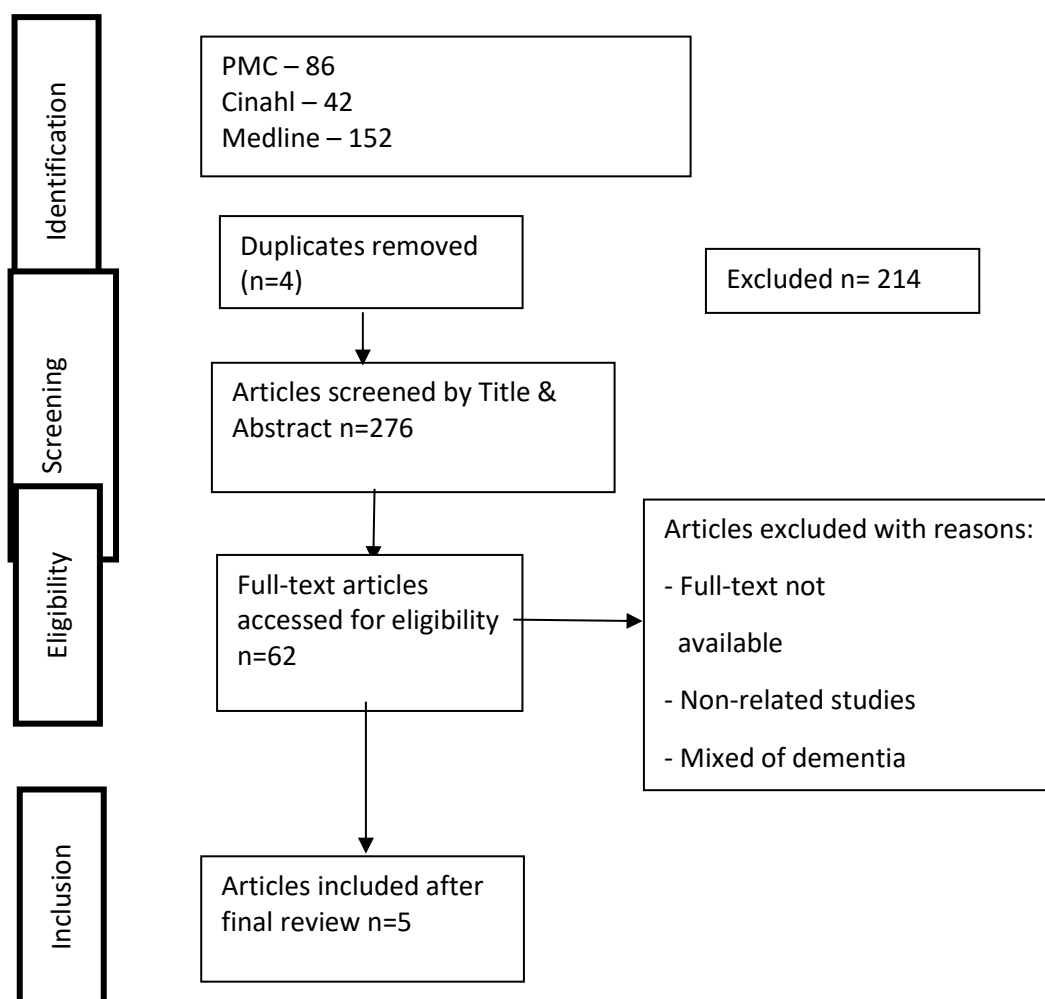
The results are descriptively summarised on KAP and the instruments used to evaluate the KAP among ICG or OPWD. It is narrated precisely. The mode/style of reporting the main outcomes in the review articles are also discussed. KAP framework was used to further guide the content, descriptive results, and thematic analysis of the scoping review results for outcome of KAP among ICG or OPWD. This framework helps to conceptualize the three essential domains of fall prevention among ICG of OPWD. It supports in summarising the needs of area to be emphasized for any form of interventions designs to improve the KAP among ICG of OPWD in fall prevention. Conflicting themes for results were discussed face to face by the research team.

Results

The databases searches yielded 280 citations in total. The study flow is detailly presented in Flow chart 1 (PRISMA-ScR flow chart). A total of 4 duplicates removed after article identifications, with remaining 276 articles screened by Title and Abstract. 214 articles were excluded thereafter and full-text articles accessed for eligibility was n=62. Articles excluded with reasons totals 52 and final articles included after review was n=5 (Appendix 1).

Included final articles were from New Zealand (Krishnamurthi et al., 2022), Europe (Bachmann, 2020), Poland (Rusowicz et al., 2021) and United Kingdom (Peach et al., 2017). Data extracted range of year was within 2016 to 2022. Proportion of study design was Qualitative (n=2) (Krishnamurthi et al., 2022; Peach et al., 2017), followed by Systematic Mixed Studies Review (n=1) (Khanassov & Vedel, 2016), Content analysis (n=1) (Bachmann,

2020) and Observational study (n=1) (Rusowicz et al., 2021). Most representative samples were all type dementia (n=3) (Khanassov & Vedel, 2016; Krishnamurthi et al., 2022; Peach et al., 2017) and next was Alzheimer's Disease (n=2) (Bachmann, 2020; Rusowicz et al., 2021). Maximum of n=4 studies were conducted with dyads (OPWD and ICG) (Bachmann, 2020; Krishnamurthi et al., 2022; Peach et al., 2017; Rusowicz et al., 2021) and one was purely on ICG (Khanassov & Vedel, 2016). Of the included articles, majority of studies are conducted in the Western context, with none conducted in the Asian context within this scoping review limit of search.



Study characteristics

Figure 1: Prisma Flow Diagram on scoping review process

Knowledge of ICG of OPWD on Fall Prevention

Overall data reported various outcome of the KAP on fall prevention among ICG of OPWD and all was narrative in nature. Knowledge on fall prevention was reported in five studies (Bachmann, 2020; Khanassov & Vedel, 2016; Krishnamurthi et al., 2022; Peach et al., 2017; Rusowicz et al., 2021). Every study demonstrated different level of understanding of ICG on fall prevention among OPWD. Various dimension on fall prevention was addressed in each study. Krishnamurthi et al., (2022) explored the knowledge on fall prevention and reported that, ICG were aware the safety as an important component in fall prevention, anyhow, the knowledge on this subject matter was reported as experienced based and was not acquired

from a trained professionals or from a reliable source. It was also narrated such that, ICG has limited or low knowledge on managing these issues. This reporting was interrelated to Khanassov & Vladel (2016), where, total of 8 articles in their review concluded ICG having less knowledge on fall prevention and managing its risk for OPWD. They seek professional help from someone to manage these issues, mainly on home environment safety. A content analysis study by Bachman (2020) on Social Media Communication of ICG of OP with AD translated the raised concern in the need to manage unexpected falls and its prevention as limited knowledge on fall prevention. Understanding safety procedures and emergency responses was mainly lacking. Some presented having some form knowledge on walking aid usage to prevent fall but cloudy. Author also concluded that, the seeking for information in managing falls related matters in social media given rise to doubt of having less knowledge on this subject matter. Similar was reported by Peach et al., (2017). 20/20 participants reported to have low level of awareness on fall risk factors and way to prevent it. Major risk factors identified to portray some form of fall knowledge was on poor eyesight and also uneven surfaces. Some has awareness on fall risk but denied this causes anxiety as they were lacking in the knowledge on its management. Poor knowledge on fall prevention reflects the practice of 'entire time' supervision causing carer burden. Many participants reported they are satisfied with the current situation as 'all are alright' and 'there is no falls', not lacking in anything for fall prevention is often expressed. Findings of Rusowicz et al., (2021) were nevertheless same with other studies, Caregivers has knowledge on the needs for fall prevention and perceive it as an important aspect of care. Anyhow, there are limited knowledge on exact method of multidomain care for fall prevention. Despite, most carer devote whole time just supervising care recipient to prevent sudden stressful events such as falls and fractures.

Attitude of ICG of OPWD in fall prevention

Four out of five studies reported ICG attitude on fall prevention among OPWD. Three reported ICG having positive attitude towards fall prevention and one reported having negative attitude. Krishnamurthi et al., (2022) narrated, ICG possessed positive attitude towards fall prevention and identified the needs for fall prevention by seeking for support in from others. Their awareness in fall prevention reflected positive attitude towards fall prevention for OPWD. Similar was reported by Bachman (2020), positive attitude noted on fall prevention as ICG seeks for the solutions through peers. Some has acknowledged the needs of using walking aids to prevent falls and seeks the information to prevent fall among the care recipient. Contradict, Rusowicz et al., (2021) reported ICG has portrayed a positive attitude towards fall prevention but presented negative attitude to seek for help. This was similar to Peach et al., (2017), ICG portrayed a negative attitude towards fall prevention as they did not generally see falls prevention interventions as currently relevant to themselves. Topics such as exercise, adaptations, mobility aids and group activities were considered as non-relevant in their care for OPWD. Some portrayed removing home hazards alone will prevent fall and not considering exercises and other risk factor managements as a fall preventive solution. Few ICG was very negative towards fall prevention actions and refer those are needed 'later on in life'.

Practice of ICG of OPWD in fall prevention

Studies resulted in various type and level of practices on fall prevention among ICG of OPWD. Only three out of four studies have identified practices on fall prevention among ICG. Anyhow,

there are practices for fall prevention but more on safety issues rather than multidomain approaches. There was also less clarity on exact measures adapted in routine care for fall prevention among OPWD. Peach et al., (2017), described the pattern and different measures of fall prevention practices by ICG. Many caregivers practice 'entire time' supervision to prevent fall. Two caregivers stop practising the use of mobility aids for fall prevention hoping the OPWD can walk normal with routine walking practices without any aids. Some ICG prompted care recipient to exercise to prevent fall, but not successful. Unwelcomed obligation noted. No relative reported seeking help from professional in managing exercise regime which patient could perform daily. Rusowicz et al., (2021) have reported the same pattern of practice, full time observation and reported, none has attempted any specific measures or other fall preventive measures to prevent fall. Krishnamurthi et al., (2022) has reported similar but with wider perspective, ICG practices fall prevention though several strategies including 'Seeking support services in ADL', 'assuring someone is home and monitor the care recipient all the time', 'minimising high fall risk associated activities', 'Supervising carer during shower'. 7/10 ICG practices fall prevention through monitoring during shower.

Instruments evaluating KAP of ICG of OPWD on Fall Prevention

There were almost no studies that reported outcomes utilizing an instrument to assess KAP of fall prevention among ICG of OPWD in this scoping review (Bachmann, 2020; Khanassov & Vedel, 2016; Krishnamurthi et al., 2022; Peach et al., 2017; Rusowicz et al., 2021). Two studies were qualitative in nature, which reported narrative outcomes, followed by observational study that reported the same. One Content analysis study design reported the outcome based on Activities of Daily Living (ADL) Concept, hence, it was also narrative in nature. Final study was Systematic Mixed Studies Review, which concluded the study with non-specific use of instruments as an outcome evaluating KAP on fall prevention among ICG of OPWD.

Discussion And Recommendations For Future Research

This scoping review resulted KAP of ICG on fall prevention is an important component to prevent fall among OPWD. A good knowledge and a positive attitude will be translated into a good practice (Mahmud et al., 2020). Poor knowledge and negative attitude carry huge lacking in routine care for fall prevention, hence, it increases the risk of fall of the OPWD. A good knowledge with negative attitude leads to poor practice significantly (Sultana et al., 2023). Anyhow, several gaps were also observed in this scoping review, many ICG has limited access to receive knowledge from a reliable source to prevent fall and manage its risk among OPWD review (Bachmann, 2020; Khanassov & Vedel, 2016; Krishnamurthi et al., 2022; Peach et al., 2017; Rusowicz et al., 2021). Most of the knowledge are gained through experience or through the peers (Bachmann, 2020; Krishnamurthi et al., 2022; Peach et al., 2017; Rusowicz et al., 2021). This review too has identified, there is a strong need to develop a reliable instrument to evaluate the KAP among ICG populations (Bachmann, 2020; Khanassov & Vedel, 2016; Krishnamurthi et al., 2022; Peach et al., 2017; Rusowicz et al., 2021). Any form of intervention or psychoeducational programs for ICG on fall prevention among OPWD needs a good evaluative outcome, therefore, a valid and reliable tool is needed to ensure the outcome of a training is merely successful.

Knowledge on fall prevention among ICG of OPWD is low. An example, article by Krishnamurthi et al., (2022) has narrated the experience of the ICG on their routine care for OPWD in fall prevention is stressful as they have knowledge to manage the fall risk but it was not in depth enough and not from a reliable knowledge source, hence they increase the

tendency to build anxiety towards fall and it impacted their personal and social life. Somehow, the attitude remains positive that the ICG seeks for potential help in managing the needs in fall prevention. Author has also described that, ICG has no support services available to help manage their needs. Resultant, they develop a false fall preventive practice by limiting the ADLs of the OPWD which eventually lead to mobility reduction and further risk of fall. Some links were found in other articles of this review, where the trends of KAP was similar (Bachmann, 2020; Krishnamurthi et al., 2022; Rusowicz et al., 2021), often the caregiver presented with positive attitude towards fall prevention but had poor knowledge and false practices in routine care. In one article (Peach et al., 2017), ICG has reported, there is no need for fall preventive measure in the daily care such as exercises and home safety. Complex multidomain fall preventive measures comes in after an ill episode or when there is already a fall occurrence. The support for fall prevention and its managements are needed at later stage.

A minority of the ICG had some form of knowledge in fall prevention and possessed a positive attitude towards the routine care, the practice was also multidomain but relatively not comprehensive enough to cater the overall risk of fall preventive measures (Bachmann, 2020; Krishnamurthi et al., 2022; Rusowicz et al., 2021). However, not every article reflected a good KAP on fall prevention by ICG among OPWD. Most were inconsistent with the interconnection between the KAP whereby, presenting low knowledge but positive attitude somehow leads to a poor practice in overall. A desired amount of knowledge and positive attitude is a key to certain amount of fall prevention in routine care for the OPWD by the ICG.

The literature we review has also concluded, there is no existing instrument to access ICG KAP on fall prevention among OPWD. Within this limit search of scoping review, no studies have reported the KAP using an instrument (Bachmann, 2020; Khanassov & Vedel, 2016; Krishnamurthi et al., 2022; Peach et al., 2017; Rusowicz et al., 2021). The study designs were mostly qualitative in nature, lacking clarity in the commonly used tools to access the KAP among these populations.

Limitations

We identified two study limitations from this scoping review. First, only 3 electronic databases were included in this study. Second, this review focuses only on publication of English language.

Conclusion And Recommendation

This scoping review helps to comprehend the KAP on fall prevention among ICG of OPWD. This review includes baseline information on KAP of ICG of OPWD, allowing new insights on what is needed for future recommendations.

Anyhow, in overall, all studies reported a low level or a poor in-depth knowledge for fall prevention among ICG of OPWD. A multidimensional knowledge on fall prevention is lacking that leading to poor and undiversified practices towards fall prevention for the OPWD. The seriousness is under evaluated leaving the consequences in a high risk although some form of positive attitude is noted among the ICG. Potential burden and risk are outweighed with the ignorance in this subject matters.

There was also trend of lacking of multidomain fall prevention care and almost all the outcomes discussed having support services and also professional help in fall prevention managements. No ICG have addressed complex multidomain fall preventive measures such

as exercises, medication managements, home modifications and many more as an important aspect of the routine care for care recipient.

Abbreviations

ICG: Informal care givers; KAP: Knowledge, Attitude, Practice; OPWD: Older person with Dementia; PwD: Person with Dementia; OP: ADL: Activities of Daily Livings; AD: Alzheimer's Disease; Older person; PRISMA-Scr: Preferred Reporting Items for Systematic Reviews and Meta-analysis Extension for Scoping Review; CINAHL: Cumulative Index to Nursing and Allied Health Literature; PMC: PubMed Central; MEDLINE: Medical Literature Analysis and Retrieval System Online; SN: Sankari A/P Nedunsaliyan; AA: Asmidawati Ashari;

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Availability Of Data And Materials

The data used in this study are available from the corresponding author on reasonable request.

Ethics

No ethical approval, consent to participate and publish needed for this study.

Declaration Of Competing Interest

The authors declare that they have no competing interests.

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Appendix 1

Table 3

Characteristics of review articles and summary table of outcome

Author / Year	Study Design / Method	Population (Country) / Sample Size	Type of Dementia	Outcomes
(Krishnamurthi et al., 2022)	Qualitative study	Ten caregivers and five people living with mild dementia (New Zealand)	All type dementia	<p>Knowledge: ICG has some form of knowledge in fall risk and its prevention. The knowledge reflects mainly from the experiences of daily care of the care recipients. None specified underwent training from a HCW or from a professional. Caregivers presented having knowledge of fall as an unsafe practice in daily life. They identified there are need for care on this subject matters.</p> <p>Attitude: Positive attitude towards fall and identified the needs for fall prevention. They seek for support in care for fall prevention.</p> <p>Practice: ICG practices fall prevention though several strategies including 'Seeking support services in ADL', 'assuring someone is home and monitor the care recipient all the time', 'minimising high fall risk associated</p>

				<p>activities’, ‘Supervising carer during shower’. 7/10 ICG practices fall prevention through monitoring during shower.</p> <p>Instrument for KAP: No instrument used for KAP assessment</p>
(Khanassov & Vedel, 2016)	Systematic Mixed Studies Review	- N/A - 8 articles	All type dementia	<p>Knowledge: Total of 8 articles has identified, ICG having less knowledge on fall prevention and its risk. They seek professional help from someone to manage these issues, mainly on home environment safety.</p> <p>Instrument for KAP: No instrument used for KAP assessment</p>
(Bachmann, 2020)	Content Analysis	Documentation of daily-life situations of one-hundred dyads based on 2110 posts published during a six-month or longer period (Czech Republic, Europe)	Alzheimer’s Disease	<p>Knowledge: ICG has raised concern in the need to manage unexpected falls and its prevention. Understanding safety procedures and emergency responses was mainly lacking. Some presented having some form knowledge on walking aid usage to prevent fall but cloudy.</p> <p>Attitude: Some form of positive attitude noted on fall</p>

				<p>prevention as ICG seeks for the solutions through peers. Some has acknowledged the needs of using walking aids to prevent falls.</p> <p>Instrument for KAP: No instrument used for KAP assessment</p>
(Peach et al., 2017)	Qualitative study	<ul style="list-style-type: none"> - 20 patient/ relative dyads - United Kingdom 	All type dementia	<p>Knowledge: 20/20 participants reported to have low level of awareness on fall risk factors and way to prevent it. Major risk factors identified to portray some form of fall knowledge was on poor eyesight and also uneven surfaces. Some has awareness on fall risk but denied this causes anxiety as they were lacking in the knowledge on its management. Poor knowledge on fall prevention reflects the practice of 'entire time' supervision causing carer burden. Many participants reported they are satisfied with the current situation as 'all are alright' and 'there is no falls', not lacking in anything for fall prevention is often expressed.</p> <p>Attitude: ICG portrayed a negative attitude towards fall</p>

			<p>prevention as they did not generally see falls prevention interventions as currently relevant to themselves. Topics such as exercise, adaptations, mobility aids and group activities were considered as non-relevant in their care for OPWD. Some portrayed removing home hazards alone will prevent fall and not considering exercises and other risk factor managements as a fall preventive solution. Few ICG was very negative towards fall prevention actions and refer those are needed 'later on in life'.</p> <p>Practice: Many caregivers practice 'entire time' supervision to prevent fall. Two caregivers stop practising the use of mobility aids for fall prevention hoping the OPWD can walk normal with routine walking practices without any aids. Some ICG prompted care recipient to exercise to prevent fall, but not successful. Unwelcomed</p>
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				<p>obligation noted. No relative reported seeking help from professional in managing exercise regime which patient could perform daily.</p> <p>Instrument for KAP: No instrument used for KAP assessment</p>
(Rusowicz et al., 2021)	Observational Study	85 caregivers (Poland)	Alzheimer's Disease	<p>Knowledge: Caregivers has knowledge on the needs for fall prevention and perceive it as an important aspect of care. Anyhow, there are limited knowledge on exact method of multidomain care for fall prevention. Despite, most carer devote whole time just supervising care recipient to prevent sudden stressful events such as falls and fractures.</p> <p>Attitude: Care giver portrayed a positive attitude towards fall prevention but presented negative attitude to seek for help.</p> <p>Practice: Common practice for fall prevention was full time observation. None has attempted any specific measures</p>

				<p>or other fall preventive measures to prevent fall.</p> <p>Instrument for KAP: No instrument used for KAP assessment</p>
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