

CAREGIVER PREPAREDNESS AS A FACTOR ASSOCIATED WITH FALL RISK IN OLDER ADULTS

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ABSTRACT

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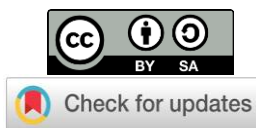
Caregiver
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Abstract:

Background: Falls in older adults are a major health problem that may lead to serious injury and reduced quality of life. In family-based care, caregiver preparedness plays an important role in fall prevention and emergency management. Objective: To analyze caregiver preparedness as a factor associated with fall risk in older adults. Methods: This correlational cross-sectional study involved 103 elderly-caregiver pairs selected through purposive sampling. Data were collected using the Caregiver Preparedness Scale and a fall risk assessment tool and analyzed using the Spearman rho test. Results: Most caregivers had moderate preparedness (45.6%), followed by low (31.1%) and high preparedness (23.3%). Fall risk in older adults was categorized as low (37.9%), moderate (26.2%), and high (35.9%). Statistical analysis showed a significant association between caregiver preparedness with fall risk in older adults ($p = 0.0001$). Conclusion: Caregiver preparedness is significantly associated with fall risk in older adults and serves as a supporting factor in preventing falls. Strengthening caregiver preparedness through education and fall prevention training is essential to reduce fall risk among older adults.

Abstrak:

Latar belakang: Kejadian jatuh pada lansia merupakan masalah kesehatan yang dapat menyebabkan cedera serius dan penurunan kualitas hidup. Dalam perawatan berbasis keluarga, kesiapsiagaan caregiver memiliki peran penting dalam pencegahan dan penanganan kegawatan akibat jatuh. Tujuan: Menganalisis peran kesiapsiagaan caregiver sebagai faktor yang berhubungan dengan risiko jatuh pada lansia. Metode: Penelitian ini menggunakan desain korelasional dengan pendekatan potong lintang (cross-sectional) pada 103 pasangan lansia-caregiver yang dipilih secara purposive sampling. Data dikumpulkan menggunakan Caregiver Preparedness Scale dan instrumen penilaian risiko jatuh, kemudian dianalisis dengan uji Spearman rho. Hasil: Sebagian besar caregiver memiliki kesiapsiagaan sedang (45,6%), diikuti rendah (31,1%) dan tinggi (23,3%). Risiko jatuh pada lansia berada pada kategori risiko rendah (37,9%), sedang (26,2%), dan tinggi (35,9%). Hasil uji statistik menunjukkan adanya hubungan yang bermakna antara kesiapsiagaan caregiver dengan risiko jatuh pada lansia ($p = 0,0001$). Kesimpulan: Kesiapsiagaan caregiver berhubungan signifikan dengan risiko jatuh pada lansia dan berperan sebagai faktor pendukung terhadap pencegahan kejadian jatuh. Peningkatan kesiapsiagaan caregiver melalui edukasi dan pelatihan pencegahan jatuh penting untuk menurunkan risiko jatuh pada lansia.



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INTRODUCTION

Indonesia is entering an aging population phase, with the proportion of older adults increasing annually. This demographic transition is likely to increase the burden of health problems associated with declines in physical, cognitive, and psychological functions, particularly the risk of falls, which represent one of the leading causes of emergencies and disability in older adults[1]. Falls emergencies not only result in physical injuries such as fractures, head trauma, and even death, but also contribute to decreased independence, increased anxiety, and a greater need for long-term care. Falls are a common geriatric syndrome; however, they have serious consequences[2].

The prevalence of fall risk among individuals aged over 55 years is 49.4%, increasing to 67.1% among those aged over 65 years. The incidence of falls among community-dwelling older adults rises from 25% at age 70 to 35% after age 75. Approximately 30% of older adults aged ≥ 65 years living in the community experience falls, some of which are recurrent [3]. These incidents not only lead to physical injuries, such as hip fractures, head injuries, and soft tissue trauma, but also trigger psychological complications, particularly fear of falling, which subsequently results in reduced physical activity, social isolation, and an overall decline in quality of life [4]. Falls requiring immediate and urgent intervention are classified as falls emergencies, defined as incidents resulting in significant injuries (e.g., fractures or head trauma) that necessitate emergency care [2].

The consequences of falls extend beyond physical injuries to include psychological problems, particularly fear of falling, which restricts mobility, increases dependency, and significantly reduces quality of life. Falls emergencies often lead to serious injuries, functional decline, loss of independence, and increased economic burden on families and healthcare systems [5]. In both community and institutional

settings, factors such as environmental hazards, multimorbidity, polypharmacy, and mobility limitations further elevate the risk of falls in older adults. Unlike controlled environments such as nursing homes, community-dwelling older adults are exposed to diverse and often unmodified environmental risks, including slippery floors, poor lighting, and stairs without handrails. In such contexts, the role of caregivers—whether family members, companions, or informal caregivers—becomes critically important. They are responsible for supervision, environmental modification, and the implementation of daily fall prevention strategies [6].

For this study, a caregiver was defined as a family member or close companion who regularly provided unpaid care, supervision, or assistance to the participating older adult in daily activities. Eligible caregivers were adult children, spouses, siblings, other family members, or close companions who were directly involved in the older adult's daily care. Professional healthcare providers, paid caregivers, and domestic workers were excluded, play a central role in the prevention, early detection, and fall risk [7].

Caregiver preparedness, which encompasses knowledge of fall risk factors, risk assessment skills, rapid response to emergencies, availability of assistive devices, and referral coordination, has the potential to be a key factor associated with risk falls [8]. However, despite the increasing number of training programs and safety policies, empirical evidence linking caregiver preparedness to the incidence of falls emergencies remains limited. Most fall prevention studies have focused on direct interventions targeting older adults, such as physical exercise and medication management. Studies that explicitly examine and validate caregiver preparedness as a strong factor associated with fall risk in community-dwelling older adults, particularly in the Patrang area, remain scarce. Therefore, this study aims to address this gap by providing empirical

evidence on the importance of interventions focused on enhancing caregiver preparedness to mitigate falls emergency risk in household settings [9].

Community-based elderly care services often face limitations in resources, variability in caregiver competence [10], and physical environmental challenges that may increase the incidence of falls. Although national and regional data indicate that fall prevention requires a multifactorial approach involving caregivers, there is still a lack of correlational studies examining the direct relationship between caregiver preparedness and fall risk in older adults [11]. This gap highlights the need for further investigation of caregiver preparedness in relation to fall risk among older adults living in community settings. Previous studies have primarily focused on individual-level risk factors for falls, such as physical function, balance impairment, comorbidities, and environmental hazards. However, limited attention has been given to caregiver preparedness as a caregiver-related factor that may be associated with fall risk among older adults in the community, particularly within the context of community-based elderly care in Indonesia [7], [12], [13].

Therefore, the novelty of this study lies in examining the association between caregiver preparedness and fall risk among community-dwelling older adults, while considering caregiver preparedness as a potentially relevant factor in the broader context of fall prevention. By examining this relationship in a community setting, this study provides additional evidence regarding the role of caregivers in supporting the safety of older adults and may provide a basis for developing caregiver-oriented approaches within community-based elderly health programs [7], [14]. Accordingly, this study aimed to analyze the relationship between caregiver preparedness and fall risk among older adults living in the community.

RESEARCH METHOD

This study employed a correlational research design with a cross-sectional approach. The study was conducted in Patrang District, Jember Regency, Indonesia. The selection of the study site was based on the accessibility of data on older adults actively participating in local *Posyandu* (integrated health service posts) and geographical considerations that supported data collection in a community setting. The target population comprised all older adults who actively participated in Integrated Healthcare Posts (*ILP*) activities in Patrang District and had caregivers (either formal or informal) responsible for their care. Based on preliminary data, the total population of active older adults in the *Posyandu* was 140 individuals. The sample size was calculated using an absolute precision formula with a 95% confidence level and a 5% margin of error, resulting in a minimum sample size of 103 older adults.

The sampling technique used was purposive sampling, including older adults and their caregivers who met the predefined inclusion criteria: (1) older adults aged over 60 years; (2) older adults living with a caregiver (family member or companion) for at least 6 months; (3) caregivers having a minimum of 3 months of caregiving experience; and (4) both older adults and caregivers willing to participate in the study by providing informed consent. The research instruments included: (1) demographic data (age, gender, relationship to the older adult, marital status, educational level, and employment status); (2) caregiver preparedness, measured using the *Caregiver Preparedness Scale*; and (3) Fall risk, assessed using the *Falls Risk Assessment Tool*.

Data analysis consisted of univariate and bivariate analyses. Univariate analysis was used to describe the frequency distribution and percentages of respondents' characteristics. Bivariate analysis was conducted to examine the

relationship between caregiver preparedness and fall risk using the Spearman's rho correlation test.

RESULTS AND ANALYSIS

Based on the study findings, the characteristics of the respondents are presented in Table 1.

Table 1.
Frequency Distribution of Caregiver

Variable	n	%
Gender		
Male	15	14,6
Female	88	85,4
Usia		
< 45 years	11	10,7
45 – 54 years	24	23,3
55 – 65 years	64	62,1
> 65 years	4	3,9
Relationship		
Child	47	45,6
Spouse	38	36,9
Sibling	13	12,6
Others	5	4,9
Marital Status		
Married	64	62,1
Unmarried	17	16,5
Widowed	14	13,6
Divorced	8	7,8
Education Level		
No Formal Education	0	0
Primary School	6	5,8
Junior High School	23	22,3
Senior High School	60	58,3
Bachelor's degree	14	13,6
Employment Status		
Employed	68	66
Unemployed	35	34

Based on Table 1, the characteristics of caregiver (n = 103) indicate that the majority were female (88 respondents; 85.4%). The age distribution shows that most respondents were in the 55–65 years age group (64 respondents; 62.1%). In terms of relationship to the older adult, the largest proportion of respondents were children (47 respondents; 45.6%). Regarding marital status, most respondents were married (64 respondents; 62.1%). Based on educational level, the majority of

respondents had completed senior high school (60 respondents; 58.3%). In terms of employment status, most respondents were employed (68 respondents; 66%).

The characteristics of the respondents of older adults are presented in Table 2.

Table 2.
Frequency Distribution of Older Adults

Variable	n	%
Gender		
Male	38	36,9
Female	65	63,1
Usia		
60 – 74 years	52	50,5
75 – 90 years	43	41,7
> 90 years	8	7,8
Education Level		
No Formal Education	0	0
Primary School	31	30,1
Junior High School	35	33,9
Senior High School	29	28,2
Bachelor's degree	8	7,8
History of Falls		
No history of falls	72	69,9
History of falls	31	30,1

Based on Table 2, a total of 103 older adults participated in this study. The majority of participants were female (65 participants, 63.1%). Regarding age distribution, most participants were in the 60–74-year age group, comprising 52 participants (50.5%). Regarding educational attainment, most participants had completed primary school (31, 30.1%) and a history of falls was reported by 36 participants (35.0%),

Table 3.
The Role of Caregiver Preparedness as a Factor Associated with Fall Risk in Older Adults

Variable	Fall Risk			N	P-value	r
Caregiver preparedness	Low	Moderate	High			
Low	0	8	24	32	0,0001	-0,697
Moderate	18	16	13	47		
High	21	3	0	24		
Total	39	27	37	103		

The analysis of the relationship between caregiver preparedness and fall risk in older adults revealed a clear pattern across variables. Among caregivers with low preparedness, the majority of older adults were categorized as having a high risk of falls (24 individuals; 75.0%), followed by moderate risk (8 individuals; 25.0%), with no respondents in the low-risk category (0%). In contrast, among caregivers with high preparedness, most older adults were classified as having a low risk of falls (21 individuals; 87.5%), while a smaller proportion were at moderate risk (3 individuals; 12.5%), and none were categorized as high risk (0%).

Meanwhile, in the group of caregivers with moderate preparedness, the distribution of falls risk was relatively balanced, with 18 older adults (38.3%) in the low-risk category, 16 (34.0%) in the moderate-risk category, and 13 (27.7%) in the high-risk category. Statistical analysis showed a significant association between caregiver preparedness and fall risk ($p = 0.0001$). The correlation coefficient ($r = -0.697$) indicates a strong negative relationship, suggesting that higher levels of caregiver preparedness are associated with lower falls emergency risk among older adults.

DISCUSSION

The findings of this study demonstrate a strong and statistically significant relationship between caregiver preparedness and fall risk in older adults ($p = 0.0001$; $r = -0.697$). The negative direction of the correlation indicates that higher levels of caregiver preparedness are associated with lower fall risk in older adults. This finding reflects a clinically consistent pattern, in which caregivers with low levels of preparedness tend to care for older adults with a higher risk of falls, whereas those with higher preparedness are more commonly associated with older adults at lower risk [5].

From a theoretical perspective, these results are consistent with the concepts of

patient safety and fall prevention, which consider falls as preventable events [15]. Recent evidence suggests that fall in older adults are influenced by a complex interplay of physical, psychological, and social factors, thereby requiring a comprehensive and multifactorial approach to prevention [16]. In this context, caregiver preparedness and fall risk appear to be associated with each other; however, this relationship should not be interpreted as a causal relationship. The findings indicate an association between the two variables but do not demonstrate that caregiver preparedness directly influences or causes changes in fall risk among older adults [17]. These findings are further supported by previous studies indicating that caregivers play a strategic role in fall prevention through the implementation of evidence-based strategies, such as environmental modifications and improvements in home safety. In addition, nursing interventions that focus on caregiver empowerment have been shown to be effective in enhancing caregiver preparedness and their ability to manage fall risk in older adults [18]. Moreover, experimental studies have demonstrated that caregiver preparedness enhancement programs can significantly improve balance in older adults and reduce the risk of falls [19].

However, these findings should also be interpreted with caution. First, although a strong association was identified, the cross-sectional design of this study does not allow for definitive conclusions regarding causality. Second, other factors, such as the health status of older adults, cognitive impairment, depression, and social conditions (e.g., living alone), have also been shown to contribute to fall risk [17]. These findings suggest that caregiver preparedness is an important factor, but not the sole factor associated with fall risk in older adults.

Furthermore, qualitative studies have shown that caregivers often experience concerns related to the risk of falls (fear of

falling) [20] which may influence their behavior, either through overprotective actions or limitations in supporting older adults' activities [17], [21]. This condition may act as a double-edged sword, whereby preparedness that is not supported by adequate knowledge may inadvertently reduce the independence of older adults [17]. The implications of these findings highlight that improving caregiver preparedness should be approached comprehensively, not only through enhancing knowledge but also through practical skills training, simulation-based learning, and continuous support from healthcare professionals. A family-centered care approach is therefore essential in fall prevention in older adults, as caregivers constitute an integral component of the community-based care system [22], [23].

These findings further indicate that caregiver preparedness plays a crucial role in determining the level of fall risk in older adults. Empirically, caregivers with low preparedness are less likely to provide optimal supervision, implement environmental modifications, and respond promptly to emergency situations, thereby increasing the likelihood of falls. Caregiver preparedness encompasses knowledge, attitudes, and skills in preventing and managing emergency conditions in older adults, particularly fall-related incidents [24]. Older adults experience physiological changes, including decreased muscle strength, impaired balance, reduced visual function, and slower protective reflexes [25]. These conditions place them at a higher risk of falling, particularly in the absence of a safe environment and adequate supervision. From a patient safety perspective, falls are considered adverse events that can be prevented through strategies such as risk identification, environmental modification, and enhancement of caregiver competence. In this context, caregiver preparedness functions as a primary protective mechanism within family-based care,

thereby serving as a key protective factor against fall in older adults [26].

The findings of this study are consistent with previous research indicating that caregivers with limited knowledge and skills tend to care for older adults with a higher risk of falls compared to those with better education and training [15]. A systematic review of intervention studies has demonstrated that home-based fall prevention programs involving family members and caregivers significantly reduce the incidence of fall in older adults. Furthermore, a study by Phelan et al. showed that caregiver education on home environment modification and safe mobility assistance techniques can significantly reduce fall risk [27]. In addition, other studies have reported that caregiver vigilance is associated with older adults' adherence to the use of assistive devices and safe behaviors during daily activities. Psychosocial factors affecting caregivers, such as fatigue and stress, have also been shown to influence their ability to effectively supervise older adults [17], [28]. Caregivers with a high caregiving burden are more likely to experience decreased preparedness, which in turn increases the risk of falls among older adults [22].

Therefore, the results of this study reinforce previous evidence that caregivers are key determinants in fall incidents in older adults, both directly through physical assistance and indirectly through decision-making in daily care. The high proportion of caregivers with moderate and low levels of preparedness suggests that many caregivers have not yet achieved optimal capacity in fall prevention. This may be influenced by limited access to health information, lack of specific training in fall prevention, and the perception that falls are a normal part of the aging process [29].

The belief that falls are a natural phenomenon in older adults may reduce caregiver vigilance toward environmental hazards, such as slippery floors, poor lighting, and inappropriate footwear. In fact, falls can lead to serious consequences,

including fractures, head injuries, and long-term dependency, ultimately increasing the burden on families and healthcare systems [17]. This study also found that although some older adults were categorized as low risk, the proportion of moderate- and high-risk individuals remained substantial. This indicates that the older adult population in this study is in a vulnerable condition, emphasizing the importance of caregiver-based interventions [19]. These findings suggest that fall prevention strategies should target not only older adults but also their caregivers [18].

Educational and training programs for caregivers focusing on early detection of fall risk, safe mobility techniques, and home environment modification should be integrated into primary healthcare services, such as community health centers and elderly integrated service posts. By improving caregiver preparedness, it is expected that fall risk in older adults can be significantly reduced.

Overall, this study demonstrates that caregiver preparedness is significantly associated with fall risk in older adults [30]. These findings are consistent with gerontological nursing theories and previous studies that position caregivers as central actors in fall prevention. High levels of caregiver preparedness function as a protective factor, whereas low preparedness increases the vulnerability of older adults to falls. Therefore, enhancing caregiver preparedness represents a key strategy in promotive and preventive efforts in elderly healthcare [31].

CONCLUSION

This study demonstrates a significant association between caregiver preparedness and fall risk in older adults. Higher levels of caregiver preparedness are associated with a lower risk of falls. Caregiver preparedness is associated with fall prevention through effective supervision, environmental modification, and prompt responses to emergency situations. Therefore, enhancing caregiver

preparedness may be considered an important component of elderly care and can be supported through structured education and training programs focusing on fall prevention, safe mobility techniques, and home environment modification. Primary healthcare services, such as community health centers (Puskesmas) and integrated service posts for older adults (Posyandu Lansia), may consider incorporating caregiver-based approaches into elderly healthcare programs.

Future research is recommended to develop and evaluate the effectiveness of caregiver preparedness intervention models in reducing fall incidence in older adults using longitudinal study designs.

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