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FEAR OF FALLING AND ASSOCIATED FACTORS AMONG OLDER ADULTS WITH KNEE OSTEOARTHRITIS AT VIET TIEP FRIENDSHIP HOSPITAL IN 2025

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ABSTRACT

Objective: To describe the prevalence and identify factors associated with fear of falling among older adults with knee osteoarthritis at Viet Tiep Friendship Hospital in 2025.

Methods: A cross-sectional descriptive study was conducted from March to October 2025 among 113 older adults diagnosed with knee osteoarthritis. Convenience sampling was applied at the outpatient clinic.

Results: The majority of participants had a high level of fear of falling (74.3%), with a mean score of 42.21 ± 13.83. Univariate analysis showed that sex, history of falls, physical function, use of assistive devices, and fall risk were significantly associated with high fear of falling ($p < 0.05$). In multivariate logistic regression, only sex (aOR = 3.05; 95% CI: 1.19–7.86; p = 0.02) and fall risk (aOR = 5.17; 95% CI: 1.54–17.33; p = 0.008) remained independently associated factors.

Conclusion: Fear of falling among older adults with knee osteoarthritis was high and significantly associated with sex and fall risk. Targeted screening and fall-prevention interventions are needed to improve psychological well-being and physical function in this population.

Keywords: Fear of falling, older adults, knee osteoarthritis, fall risk.

1. INTRODUCTION

Knee osteoarthritis is one of the most prevalent chronic musculoskeletal disorders among older adults, characterized by pain, joint stiffness, and functional impairment, which consequently increase the risk of falls and loss of independence in activities of daily living [1]. Beyond the physical consequences of falls, fear of falling has been increasingly recognized as a major health concern with a high prevalence in the elderly population. A large-scale systematic review estimated the global pooled prevalence of fear of falling to be approximately 49.6%, with higher rates observed among individuals with chronic diseases and in developing countries [2].

Among patients with knee osteoarthritis, fear of falling is not only common but also multifactorial, influenced by both physical and psychological determinants. Previous studies have demonstrated that joint pain, functional limitations, and reduced muscle strength impair postural control, thereby increasing perceived fall risk and contributing to the development of fear of falling [3]. Importantly, fear of falling is not merely a consequence of functional decline but also a significant predictor of future falls. Through activity restriction, it may lead to muscle weakness, impaired balance, and further exacerbate the downward spiral of functional decline in older adults.

Despite accumulating evidence on the importance and consequences of fear of falling, studies investigating its prevalence and associated factors among older adults with knee osteoarthritis in Hai Phong remain limited. Therefore, this study aimed to describe the current status and identify factors associated with fear of falling among older patients with knee osteoarthritis at Viet Tiep Friendship Hospital, with the objective of providing scientific evidence to support the development of appropriate nursing interventions to reduce fear of falling, improve functional capacity, and enhance quality of life.

2. METHODS

2.1. Study participants

The study population comprised older adults diagnosed with knee osteoarthritis who attended the Department of Internal Medicine – Musculoskeletal Clinic at Viet Tiep Friendship Hospital.

- Inclusion criteria:

+ Patients aged ≥ 60 years.

+ Diagnosis of knee osteoarthritis confirmed by a specialist physician according to the criteria of the American College of Rheumatology (ACR, 1991) [4].

+ Stable health status and ability to cooperate with study procedures.

- Exclusion criteria:

- Inability to participate due to language impairment, cognitive decline, or sequelae of stroke.

- Presence of other joint diseases (e.g., rheumatoid arthritis, gout) that may affect mobility.

- Mobility limitations not attributable to knee osteoarthritis (e.g., paralysis, muscle weakness, or neuromuscular disorders).

2.2. Setting

The study was conducted at the Internal Medicine – Musculoskeletal Clinic of Viet Tiep Friendship Hospital.

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2.3. Study period

The study was carried out from March 2025 to October 2025.

2.4. Study design

A descriptive cross-sectional study design was employed.

2.5. Sample size and sampling method

The sample size was calculated using the formula for estimating a proportion. Based on a previous study among older adults with knee osteoarthritis, the prevalence of fear of falling was 88.2%; therefore, p = 0.882 was used [1]. With a 95% confidence level (Z = 1.96) and a margin of error of 0.06, the minimum required sample size was 111 participants. During data collection, a total of 113 eligible older adults with knee osteoarthritis were recruited and included in the study.

A non-probability convenience sampling method was employed.

2.6. Study variables and measurements

General characteristics: age, sex, place of residence, marital status, educational level, occupation, body mass index (BMI), number of falls in the past 12 months, disease duration, affected joint site, and use of assistive walking devices.

Physical function: assessed using the Barthel Index, which consists of 10 items with a total score ranging from 0 to 100. In this study, participants were categorized into two groups: independent (≥ 90 points) and dependent (< 90 points) [5].

Risk of falls: evaluated using the Timed Up and Go (TUG) test. Participants were instructed to perform the test following a standardized protocol: starting from a seated position, standing up upon command, walking a distance of 3 meters, turning around, and returning to sit down. The time was recorded from the moment the participant left the chair until they were seated again. Results were classified as low fall risk (< 14 seconds) and high fall risk (≥ 14 seconds) [4].

Fear of falling: assessed using the Falls Efficacy Scale–International (FES-I), which includes 16 items, each scored from 1 to 4, yielding a total score ranging from 16 to 64. Higher scores indicate greater fear of falling. According to standard classification, FES-I scores were categorized as: no fear of falling (16 points), low (17–19 points), moderate (20–27 points), and high (28–64 points) [6].

2.7. Data collection procedures

Data were collected through direct face-to-face interviews and observation of participants, supplemented by relevant information extracted from medical records.

2.8. Data analysis

Data were entered and analyzed using SPSS version 20.0. Descriptive statistics were used to summarize frequencies, percentages, means, and standard deviations. Associations between variables were examined using logistic regression analysis. Variables with $p < 0.25$ in univariate analysis or those with clinical relevance were included in the multivariable model. Results were presented as odds ratios (ORs) with 95% confidence intervals (CIs), and a p-value < 0.05 was considered statistically significant.

2.9. Ethical considerations

The study was approved by the Scientific Committee of Viet Tiep Friendship Hospital (Decision No. 4253/QĐ-BVVT, dated November 6, 2025). Participants were fully informed about the study objectives and procedures, and participation was voluntary, with the right to withdraw at any time. All personal information was kept confidential and used solely for research purposes. The study was non-interventional and posed no risk to participants' health.

3. RESULT

Table 1. General characteristics of the study participants (n = 113)

Variables		n	%
Age	60–69	61	54,0
	70–79	43	38,1
	≥80	9	7,9
Sex	Male	26	23,0
	Female	87	77,0
Place of residence	Urban	45	39,8
	Rural	68	60,2
Education	< High school	80	70,8
	≥ High school	33	29,2
BMI	<18,5	6	5,3
	18,5–22,9	52	46
	≥23	55	48,7
Falls in the past 12 months	None	75	66,4
	≥1 times	38	33,6
Walking aid use	Yes	29	25,7
	No	84	74,3
Disease duration	< 5 years	68	60,2
	≥ 5 years	45	39,8
Laterality of knee osteoarthritis	Unilateral	31	27,4
	Bilateral	82	72,6

Participants were predominantly aged 60–69 years (54.0%), with a female predominance (77.0%). A majority resided in rural areas (60.2%) and had an educational level below high school (70.8%). Nearly half of the sample was classified as overweight or obese (BMI ≥ 23) (48.7%). A history of falls in the past 12 months was reported by 33.6% of participants, while 25.7% used assistive walking devices. Most participants had a disease duration of less than 5 years (60.2%), and bilateral knee osteoarthritis was observed in 72.6% of cases.

Table 2. Characteristics of fall risk and physical functioning among the study participants (n = 113)

Variables		n	%
Physical functioning (89,96 ± 18,05)	Independent	83	73,5
	Dependent	30	26,5
Fall risk (14,35 ± 6,25)	Low risk	66	58,4
	High risk	47	41,6

Most participants were functionally independent (73.5%), with a mean Barthel Index score of 89.96 ± 18.05. The mean TUG score was 14.35 ± 6.25 seconds, and 41.6% were classified as having a high risk of falls.

Table 3. Characteristics of fear of falling among the study participants (n = 113)

Fear of falling	n	%
No fear of falling	3	2,7
Low fear of falling	1	0,9
Moderate fear of falling	25	22,1
High fear of falling	84	74,3
Mean: 42,21; SD: 13,83; Min = 16; Max = 64		

The mean FES-I score was 42.21 ± 13.83 (range: 16–64). The majority of participants were classified as having a high level of fear of falling (74.3%), whereas only a small proportion reported no or low levels of fear.

Table 4. Univariate logistic regression analysis of factors associated with fear of falling among the study participants (n = 113)

Variables		Fear of falling		OR 95% CI	P
		Low	High		
Sex	Male	12 (46,2)	14 (53,8)	3,53 1,39 – 8,99	0,008
	Female	18 (20,5)	70 (79,5)		
Age	< 70	29 (31,1)	42 (68,9)	1,90 0,79 – 4,57	0,15
	≥ 70	10 (19,2)	42 (80,8		
Place of residence	Urban	17 (25,0)	51 (75,0)	0,92 0,38 – 2,16	0,84
	Rural	12 (26,7)	33 (73,3)		
Laterality of knee osteoarthritis	Unilateral	9 (29,0)	22 (71,0)	1,27 0,50 – 3,19	0,62
	Bilateral	20 (24,4)	62 (75,6)		
Falls in the past 12 months	No	25 (31,2)	55 (68,8)	3,29 1,05 – 10,38	0,04
	Yes	4 (12,1)	29 (87,9)		
Physical functioning	Independent	26 (31,3)	57 (68,7)	4,11 1,14 – 14,76	0,03
	Dependent	3 (10,0)	27 (90,0)		
Walking aid use	No	26 (31,0)	58 (69,0)	3,89 1,09 – 13,99	0,04
	Yes	3 (10,3)	26 (89,7)		
Fall risk	No	25 (37,9)	41 (62,1)	6,56 2,10 – 20,47	0,001
	Yes	4 (8,5)	43 (91,5)		

Univariate logistic regression analysis identified several factors significantly associated with high fear of falling ($p < 0.05$). Specifically, female sex (OR = 3.53; 95% CI: 1.39–8.99), history of falls (OR = 3.29; 95% CI: 1.05–10.38), dependence in physical functioning (OR = 4.11; 95% CI: 1.14–14.76), use of assistive walking devices (OR = 3.89; 95% CI: 1.09–13.99), and high fall risk (OR = 6.56; 95% CI: 2.10–20.47) were associated with increased odds of high fear of falling. Other variables were not statistically significant ($p > 0.05$).

Table 5. Multivariable logistic regression analysis of factors associated with fear of falling among the study participants (n = 113)

Variables		aOR	95% CI	P
Sex	Male	3,05	1,19 – 7,86	0,02
	Female			
Age	< 70	1,62	0,58 – 4,42	0,36
	≥ 70			
Falls in the past 12 months	No	1,73	0,48 – 6,12	0,40
	Yes			
Physical functioning	Independent	1,77	0,34 – 9,2	0,50
	Dependent			
Walking aid use	No	1,66	0,30 – 9,18	0,56
	Yes			
Fall risk	No	5,17	1,54 – 17,33	0,008
	Yes			

Multivariable logistic regression analysis showed that only sex and fall risk remained independently associated with high fear of falling. Female participants had higher odds of high fear of falling compared with males (adjusted OR [aOR] = 3.05; 95% CI: 1.19–7.86; p = 0.02). In addition, participants with a high risk of falls were more likely to report high fear of falling than those at low risk (aOR = 5.17; 95% CI: 1.54–17.33; p = 0.008).

4. DISCUSSION

In this study, 74.3% of participants reported a high level of fear of falling, with a mean FES-I score of 42.21 ± 13.83, indicating a substantial level of concern when performing daily activities. These findings highlight a considerable burden of fear of falling within the study population. Compared with previous domestic studies in similar patient groups, our results are markedly higher. A study by Tran Thanh Huyen et al. (2025) reported a mean FES-I score of 25.6 ± 6.5 and a prevalence of high fear of falling of 34.4% among patients with knee and/or hip osteoarthritis [7]. The difference is evident not only in prevalence but also in severity, as reflected by the substantially higher mean score in the present study. This may suggest that participants in our study had greater functional impairment or a higher risk of falls, contributing to increased fear of falling.

Similarly, when compared with the study by Nguyen Thi Hoai My et al. (2023) conducted among hospitalized older adults, the prevalence of fear of falling in our study (74.3%) remained higher than that reported (65.5%), along with a higher mean FES-I score (42.21 vs. 31.57) [8]. This indicates that even relative to inpatient populations, who are typically considered at higher risk, the level of fear of falling observed in our sample was more pronounced. In contrast, the prevalence reported in this study was

lower than that observed by Fernandes et al. among older women with knee osteoarthritis (88.2%) [1]. This discrepancy may be explained by differences in study populations, as the study by Fernandes included only older women, a group known to have a higher susceptibility to fear of falling, whereas our study included both sexes with more heterogeneous characteristics. Overall, these findings suggest a consistent pattern in which both the prevalence and severity of fear of falling increase among individuals with musculoskeletal disorders and functional impairment. This can be explained by the pathophysiological features of osteoarthritis, including chronic pain, reduced range of motion, and joint instability, which impair balance control and heighten perceived fall risk. According to Albert Bandura's self-efficacy theory, when individuals perceive their mobility as unsafe, their confidence decreases and anxiety increases during activity performance, thereby contributing to greater fear of falling [9]. In univariate analysis, female sex was associated with a higher likelihood of high fear of falling compared with males (OR = 3.53; $p < 0.05$), and this association remained significant in the multivariable model (aOR = 3.05; $p = 0.02$). This finding is consistent with previous studies conducted in Vietnam and internationally [1,10]. The observed difference may be attributed to both biological and psychological factors, as women tend to have lower muscle strength and may perceive a higher risk of falling than men. Fall risk emerged as the strongest associated factor in both univariate (OR = 6.56; $p = 0.001$) and multivariable analyses (aOR = 5.17; $p = 0.008$). This finding suggests a close relationship between fear of falling and actual fall risk, indicating that fear of falling may, to some extent, reflect an individual's underlying risk of falling. This is consistent with previous findings [8]. The relationship is likely bidirectional: increased fall risk may heighten anxiety, while fear of falling may lead to activity restriction, further increasing fall risk over time.

Other variables, including history of falls, physical functioning, and use of assistive devices, were significant in univariate analysis but did not retain significance in the multivariable model. This suggests that these factors may not act as independent predictors but rather exert indirect effects through fall risk. This finding differs from that reported by Fernandes et al. [1], where history of falls was identified as an independent factor. The discrepancy may be explained by differences in model structure, particularly the inclusion of fall risk in our model, which may have attenuated the independent effect of prior falls due to overlapping clinical relevance. Similarly, the lack of independent association between physical functioning and fear of falling aligns with previous findings [10], suggesting that single functional measures may not fully capture fall risk unless considered within a broader context. The use of assistive devices may also reflect underlying functional impairment or elevated fall risk rather than acting as an independent determinant.

In contrast, factors such as age, place of residence, and osteoarthritis characteristics were not significantly associated with fear of falling in either model. This suggests that demographic characteristics alone may be less influential than functional impairment and fall risk in shaping fear of falling.

From a mechanistic perspective, these findings can be explained by the interaction between functional decline and risk perception. In patients with osteoarthritis, pain, limited mobility, and joint instability reduce balance control, thereby increasing fall risk and simultaneously amplifying fear of falling.

5. CONCLUSION

This study found that fear of falling among older adults with knee osteoarthritis was predominantly at a high level. Univariate logistic regression identified several factors associated with high fear of falling, including sex, history of falls, physical functioning, use of assistive devices, and fall risk. However, in the multivariable model, only sex and fall risk remained independently associated factors.

These findings highlight the importance of assessing fall risk and related factors in identifying and managing fear of falling among patients, thereby informing the development of appropriate interventions to improve functional outcomes and quality of life.

REFERENCES

[1] Fernandes VDO, Moreira BDS, Melo GASC, Avelar NCP, Costa HS, Bastone ADC. Factors associated with fear of falling in older women with knee osteoarthritis: a cross-sectional study. Geriatr Nurs. 2024;55:333–338. doi:10.1016/j.gerinurse.2023.12.018

[2] Xiong W, Wang D, Ren W, Liu X, Wen R, Luo Y. The global prevalence of and risk factors for fear of falling among older adults: a systematic review and meta-analysis. BMC Geriatr. 2024;24(1):321. doi:10.1186/s12877-024-04882-w

[3] Rosadi R, Jankaew A, Wu PT, Kuo LC, Lin CF. Factors associated with falls in patients with knee osteoarthritis: a cross-sectional study. Medicine (Baltimore). 2022;101(48):e32146. doi:10.1097/MD.0000000000032146

[4] Thai NT, Tam NN, Luc VT, Huyen VTT. Falls in older people with primary knee osteoarthritis. Vietnam Medical Journal. 2023; 532 (2): 213 – 217

[5] Istas A. The Barthel Index [Internet]. [cited 2026 May 3]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK470345/

[6] Yardley L, Beyer N, Hauer K, Kempen G, Piot-Ziegler C, Todd C. Development and initial validation of the Falls Efficacy Scale-International (FES-I). Age Ageing. 2005;34(6):614–619. doi:10.1093/ageing/afi196

[7] Huyen TTT, Hoang TNP, Duc HT. Characteristics of fear of falling among patients with knee and hip osteoarthritis. Vietnam Medical Journal. 2025;553(8):216–220.

[8] My NTH, Loan DT, Chung NT, Thao NT. Assessment of fear of falling and fall risk among elderly inpatients at the department of musculoskeletal - endocrinology, thanh hoa provincial general hospital. Journal of Medical Research. 2025;192(7):318–327.

[9] Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. Psychol Rev. 1977;84(2):191–215. doi:10.1037/0033-295X.84.2.191

[10] Linh NHT,Mai NP. Fear of falling and associated factors among community-dwelling older adults in Hue. Journal of Medicine and Pharmacy. 2021;11(4):73–80.