Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/nc2tcg39

IMPACT OF FEAR OF FALL ON FUNCTIONAL INDEPENDENCE AMONG COMMUNITY DWELLING OLDER ADULTS

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ABSTRACT

Background: Aging, is an inevitable natural process, which brings cognitive decline and muscle weakness, ultimately leading to falls. Falls are the second main cause of elderly deaths globally. Between 28-35% of seniors over 65 experience falls annually, result in fractures, injuries, and a prevalent fear of falling (FOF), affecting a quarter of older individuals in communities.

Objective: To determine the impact of fear of fall on functional independence among community dwelling older adults.

Methods: A descriptive cross sectional study was conducted in different community settings among older adults of age 64-74 years old. The total duration of study was 6 months from June, 2023 to December 2023. The data was collected from 99 participants, selected through non probability convenient sampling technique, who fulfilled the inclusion criteria. Fall Efficacy Scale (FES) and Functional Independence Measurement Scale (FIM) were used to collect data. Data was entered and analyzed by using SPSS version 16.

Results: Out of 99 participants individuals with low FES scores are perceived to have high self-efficacy and confidence in their ability to perform activities without the fear of falling, while high FES scores indicate a significant fear of falling and low self-efficacy in performing activities without the fear of falling

Conclusion: The study concluded that there is a significant moderate to strong negative relationship between the fear of falling and functional independence.

Key terms: Fall, Fear of Fall, Functional Independence, Community Dwelling Older Adult

INTRODUCTION:

On a global scale, aging an irreversible natural occurrence, (1) results in reduce cognitive activity, muscle weakness and incoordination, which ultimately leads to fall. Fall is the second main leading cause of death in elderly people (2). As per World Health Organization's description, falls are classified as unintentionally ending up on the ground, floor, or a lower level, with the exception of deliberate actions to position oneself onto furniture, walls, or similar surfaces (3, 4). Older adults more than 65 years of age and commonly older women are more susceptible for fall (5). According to estimates, between 28 and 35% of seniors over the age of 65, and between 32% and 42% of seniors over the age of 75, experienced at least one fall in a year (6). Every year in United States, one in three persons 65 years and older experience fall, and 46% of those fall result in the mortality of various factors (7).

Fall among older adults have adverse consequences, encompassing fractures, traumatic injuries, and unsettling fear of falling (FOF) (8).Roughly a quarter of older people in communities admit to have a fear of fall (9). Prevalence of FOF among community dwelling older adults reported to be 29% in USA, 57.9% in Japan, and 76.6% in Korea (5). Fear of Fall (FOF) is reported 54% and 38% activity restriction among older people (10). This fear could potentially result in increased medication use, restricted activities, decrease physical strength, an elevated likelihood of experiencing falls once more, and, in cases, necessitating a transition to care facilities (11).

The relationship between fall and fear of fall is established in literature (12). Numerous elements contribute to or trigger falls in the elderly. These factors categorized as intrinsic or extrinsic risk factors (13). The extrinsic factors have association with the environment and include factors as tripping, stumbling, walk on uneven terrain, and poor lightning or lose rugs in the home. The inherent or patient related factors include age, gender, general poor health, being underweight or overweight, comorbidities, hypertension, stroke, osteoporosis, depression, diabetes, vertigo, syncope, weakness in lower extremity, poor balance, gait analysis, and poor gait (14). This results in the increase in the activity restriction and social isolation among community dwelling older adults. Therefore, it is important to reduce the risk factors that lead to fatal fall injuries in older adults.

Bahat Ozturk et al (2020) reported 44.6% Fear of Fall (FOF) was prevalent among community dwelling older adults of age 60 years of while the prevalence of falls was 37.7%, 80.4% in females, 43.9% in sarcopenic participant leading to limitations in activity of daily living (8). Similarly, Liu et al (2014), mentioned 64.73% community dwelling older people aged more than 65 years had fear of falling, 65.63% had no history of fall but still had fear of fall. Participant's main concern was to walk on a slippery floor or walk down a slope or in a crowded place. Additionally, female had low self -perceived well-being associated with fear of falling (15).

Furthermore, Lawson et al (2014) revealed that there is a moderate correlation between impaired functional mobility and dependence with activities of daily livings (ADLS) by having FOF (7). While Adam et al (2021) mention the functional limitation and FOF associated with walking speed. The faster walking speed linked to the lower risk of fall. Falls co-relate with ongoing difficulties in daily activities, which worsen for some older individuals over time so walking speed could help identify fall risk, and understanding the challenges faced by the patient during daily activities post fall (16).

Various effective interventions are helpful for post fall patients. But, it is important to work on the prevention and risk factors modification commonly faced by the seniors in community, which can reduce the rate of fall and ultimately help the older adults to easily participate in their functional tasks (ADLs and IADLs). Therefore, the aim of the study was to determine the impact of fear of fall on functional independence and how it actually affects the functional independence of community dwelling older adults, which can help healthcare professionals to develop better management plans, fall prevention strategies and interventions to improve the quality of life. Additionally, it further helps in addressing gaps in the existing research, exploring the relationships between walking

speed, dual-task demands, functional independence, and falls in a specific population of older adults receiving home health services, and utilizing direct observation to provide more accurate and relevant insights.

Material & Method:

A descriptive cross-sectional study was conducted following ethical approval from the Ethical Committee of the Lahore College of Physical Therapy, LMDC. Data collection took place from June 2023 to December 2023 at Ghurki Trust Teaching Hospital, Manawan Hospital, and Darul Kafala (Old Age Home). The sample size of 99 participants was calculated by Open Epitool (7). A non-probability convenience sampling technique used for data collection.

The study included older adults aged 65-74 years, both male and female, who were receiving medical services. Participants were required to possess a sufficient level of cognitive function to understand and respond to the questions and voluntarily provide informed consent. The exclusion criteria were adults with a history of major disabilities such as stroke, paraplegia, quadriplegia, Parkinson's disease, recent trauma, confirmed medical diagnoses of dementia, severe cognitive disabilities, and impaired communication skills.

Participants completed a 16-item self-report questionnaire, the Fall Efficacy Scale (FES), and the Functional Independence Measure (FIM). The FES assessed participants' concerns or fear of falling while performing various activities of daily living. Participants rated their level of concern on a scale of 0 (not at all concerned) to 4 (very concerned), with a total possible score of 64, reflecting overall fall efficacy. The FES demonstrated excellent internal and test-retest reliability, with Cronbach's alpha of 0.96 and ICC of 0.96 (17). The FIM is a standardized tool used to evaluate disability levels and dependency in performing activities of daily living (ADLs), covering 18 items related to self-care, mobility, and cognition (18). Each item is rated on a seven-point scale from 1 (complete dependence) to 7 (complete independence), yielding a total score of 126, which measures overall functional independence. The FIM showed good internal consistency and reliability, with a Cronbach's alpha ranging from 0.88 to 0.97(19)

Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 16. Descriptive statistics, including means and standard deviations for continuous variables, and frequencies and percentages for categorical variables, were used to summarize the study variables. Correlation analysis was performed to assess the impact of fear of falling on functional independence. The results were presented in graphs and charts to illustrate group differences and variable distributions.

RESULTS:

The results were described in tabulated and graphical representation. Table 1 represented the demographics variables of included participants. Out of 99 participants minimum age of participants was 65 years and maximum age was 74 years, mean age was 68.98±3.42. The gender distribution mentioned in Table 1 showed 50.5% (n=50) were males and 49.5% (n=49) were females. Table 2 showed FES scale analysis among 99 participants reveal varying levels of concern about falling during different daily activities. While walking around their homes, 53.5% of participants reported no concern, 33.3% were somewhat concerned, 11.1% were fairly concerned, and only 2% expressed high concern about falling. When dressing or undressing, 55.6% showed no concern, 39.4% were somewhat concerned, and 5.1% were fairly concerned.

Regarding stair use, 20.2% of participants reported a fear of falling, while 17.2% had no concern, 42.4% were somewhat concerned, and 20.25% were fairly concerned. For walking on slippery surfaces or slopes, 28.3% of participants expressed a fear of falling, and 30.3% were fairly concerned. Uneven surfaces raised concern among participants, with 17.2% highly concerned and 42.4% somewhat concerned.During overhead activities, 35.4% of participants were not concerned, 33.35% were somewhat concerned, 19.2% were fairly concerned, and 12.1% expressed high concern. For the seemingly simple task of getting in and out of a chair, 55.6% were not concerned, 30.3% were somewhat concerned, 11.1% were fairly concerned, and 3.0% had a fear of falling. High concern was reported by 9.1% of participants when showering or bending to pick things up,

and 6.1% were highly concerned about going out to visit relatives or shops. When picking up the telephone before it stops ringing, 31.3% were not concerned, 39.4% were somewhat concerned, 19.2% were fairly concerned, and 10.1% expressed high concern. Crowded places, such as shopping areas, caused high concern for falling among 17.2% of participants, while an equal percentage had no concern. The total scoring was 33.16± 12.75 mentioned in Table 4.

The Functional Independence Measurement Score (FIM) was mentioned in Table 3 providing in depth analysis of self-care, mobility, sphincter control, communication and social cognition. Regarding Self-care, eating and grooming, 91.9% and 74.7% older adults were completely independent. In bathing and toileting 41.4% and 42.4 % participants needed modified independence and only 1.0% needed minimal assistance. The mobility showed small % of participants required assistance: 2.0% needed maximum and 12.1% minimal help with stairs, while minimal help was also needed by 3.0% for walking and 2.0% for bed transfers. Independence was high, with over half managing ambulation, bed, shower, and toilet transfers on their own. 77.8% of participants were completely independent in their bowel and bladder management.

According to Table 3; most participants were independent in understanding instructions (75.8%), communication (77%), and social interactions (75.8%), with only a small fraction requiring assistance. For problem-solving, 70% were independent, while 22.2% needed modified independence, and a few required supervision or moderate help. In memorizing tasks, 60.6% had no issues, but 27.3% needed modified independence, 10.0% needed supervision, and 2.0% required moderate assistance with total FIM score of 117.322±10.39. Finally, the correlation analysis, mentioned in Table 5 and Figure 1, revealed strong, significant negative relationship between fear of falling and functional independence ($r = -0.750$, $p < 0.01$), indicating that higher fear of falling is associated with lower functional independence. This statistically significant finding underscores the inverse link between these variables, where increased fear corresponds to decreased independence and vice versa.

Table 1: Descriptive statistics of Demographic Variables:

Variable (n=99)		**Mean ±S.D**	**Frequency (%)**
Age		68.98±3.42	-
Gender	Male	-	50 (50.5%)
	Female	-	49 (49.5%)

Table 2: Descriptive analysis of Fall Efficacy Scale (FES)

FALL EFFICACY SCALE (FES)				
Questions (How concerned are you about...)	**Not at all concerned**	**Somewhat concerned**	**Fairly concerned**	**Very concerned**
	F (%)	**F (%)**	**F (%)**	**F (%)**
Walking around your home?	53(53.5%)	33(33.3%)	11(11.1%)	2(2%)
Getting dress or undressed?	55(55.6%)	39(39.4%)	5(5.1%)	0
Preparing simple meal?	41(41.4%)	49(49.5%)	9(9.1%)	0
Going up and down stairs?	17(17.2%)	42(42.4%)	20(20.25%)	20(20.2%)
Walking on slippery surface?	13(13.1%)	28(28.3%)	30(30.3%)	28(28.3%)
Walking outside on uneven surfaces?	21(21.2%)	34(34.3%)	27(27.3%)	17(17.2%)
Walking up or down a slope?	13(13.1%)	28(28.3%)	30(30.3%)	28(28.3%)
Reaching overhead for objects?	35(35.4%)	33(33.35%)	19(19.2%)	12(12.1%)

Getting in and out of chair?	55(55.6%)	30(30.3%)	11(11.1%)	3(3.0%)
Taking a shower or bath?	36(36.4%)	37(37.4%)	17(17.2%)	9(9.1%)
Going to crowded places (shopping malls etc)?	17(17.2%)	42(42.4%)	20(20.25%)	17(17.2%)
Going to answer telephone before it stops ringing?	31(31.3%)	39(39.4%)	19(19.2%)	10(10.1%)
Bending down to pick up objects from floor?	35(35.4%)	42(42.4%)	13(13.1%)	9(9.1%)
Visiting a friend or a relative?	37(37.4%)	39(39.4%)	17(17.2%)	6(6.1%)
While going to the shop?	37(37.4%)	38(38.4%)	18(18.2%)	6(6.1%)
Using public transportation?	22(22.2%)	39(39.4%)	25(25.3%)	13(13.1%)

Table 3: Descriptive Analysis of Functional Independence Measurement Score (FIM)

FIM								
	Questions	**Complete dependence**	**Maximum assistance**	**Moderate assistance**	**Minimal assistance**	**Supervision**	**Modified independence**	**Complete independence**
		F (%)	**F (%)**	**F (%)**	**F (%)**	**F (%)**	**F (%)**	**F (%)**
SELF CARE	Feeding	0	0	0	3(3.0%)	0	5(5.1%)	91(91.9%)
	Grooming	0	0	0	3(3.0%)	6(6.1%)	16(16.2%)	74(74.7%
	Bathing	0	0	1(1.0%)	1(1.0%)	4(4.0%)	42(42.4%)	51(51.5%)
	Toileting	0	0	0	1(1.0%)	4(4.0%)	41(41.4%)	53(53.5%)
	Dress lower body	0	0	0	3(3.0%)	11(11.1%)	28(28.3%)	57(57.6%)
	Dress upper body	0	0	0	3(3.0%)	11(11.1%)	29(29.3%)	56(56.6%)
Mobility	Stairs	0	2(2.0%)	3(3.0%)	12(12.1%)	0	0	0
	Ambulation	0	0	0	3(3.0%)	1(1.0%)	38(38.4%)	57(57.6%)
	Bed transfer	0	0	0	2(2.0%)	4(4.0%)	40(40.4%)	53(53.5%)
	Toilet transfer	0	0	0	1(1.0%)	2(2.0%)	40(40.4%)	56(56.6%)
	Shower transfer	0	0	0	1(1.0%)	3(3.0%)	41(41.4%)	54(54.5%)
Sphincter control	Bowel management	0	0	1(1.0%)	1(1.0%)	2(2.0%)	18(18.2%)	77(77.8%)
	Bladder managem	0	0	0	2(2.0%)	1(1.0%)	19(19.2%)	77(77.8%)

	ent							
Communication	Comprehension	0	1(1.0%)	0	1(1.0%)	4(4.0%)	18(18.2%)	75(75.8%)
	Expression	0	0	0	1(1.0%)	3(3.0%)	18(18.2%)	77(77.8%)
Social Cognition	Social interaction	0	0	3(3.0%)	0	4(4.0%)	17(17.2%)	75(75.8%)
	Problem solving	0	0	2(2.0%)	0	5(5.1%)	22(22.2%)	70(70.7%)
	Memory	0	0	2(2.0%)	0	10(10.1%)	27(27.3%)	60(60.6%)

Table 4: The cumulative Scoring of FES and FIM scale :

Scale	Mean± S.d
FES total score	33.16±12.75
FIM total score	117.322±10.39

Table 5: Correlational analysis:

Variables	Pearson correlation	Significance
Fear of fall + functional independence	-0.750	0.000**

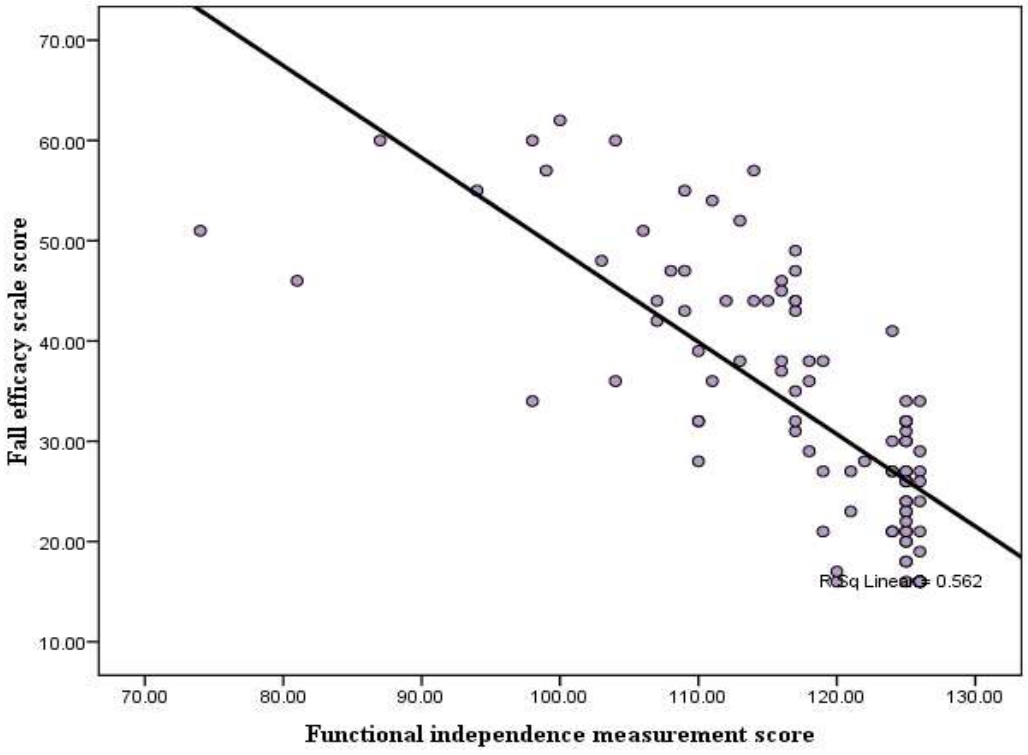

Figure 1: Correlation analysis of FOF with Functional Independence:

DISCUSSION:

In the current study, to know the effect of fear of fall on functional independence, two self -reported questionnaires were utilized: Fall efficacy scale (FIM) and functional independence scale (FIM). Older adults of age 64-74 were included in this study, both male and females, (50.5% males and

49.5% females) with a mean age of 68.9 years, Who are living in community and not taking any health services. In 2014, a similar study was conducted in which FES was used for fear of fall and KATZ- index was used to determine the scores of functional independence and time up and go scale for balance in older adults who specifically were seeking home health services. The participants were primarily female (66.7%), Hispanic (65.7%), and over the age of 75. The correlation coefficient between fear of falling and functional independence, as measured by the KATZ ADL-staircase, was not provided in the study. However, the study did find that fear of falling was associated with functional activity. While current study concluded that there is a significant negative relationship between fear of fall and functional independence, as fear of fall increases the functional activity of the older individual decreases (Lawson and Gonzalez, 2014).

Allison et, al. conducted a study in 2013, he stated that participation restriction is not predicted by fear of falling, but by actual balance and mobility abilities in rural community dwelling older adults. In comparison to current study findings, his study indicated that there was a notable correlation between fear of falling and objective measurement of balance. The results supported that participation restriction may be a key mediator between FOF, Balance, mobility issues, and risk of falling. While current study found the relationship of fear of fall, not specifically with balance but daily activities of livings (ADLS) which ultimately require the balance, coordination, strength in order to complete a task. (20).In the current study, there was a moderate and strong correlation between fear of fall and functional independence. In comparison to this study, Schoene et, al. in 2019 conducted a systematic review, analyzing a linear association (higher FoF levels were linked to lower quality of life), and indicating that fear of fall has greater influence on quality of life in older people (21).

The hall mark of the current study was to find the relationship between fear of fall and functional independence, so that its assessment should be incorporated in the examination as well as in the interventional plan. In comparison to the current study, Amanda et, al, in 2019, collected qualitative as well as quantitative data. She used BTrackS Balance Test (BBT) and a dynamometer to assess physiological fall risk, and Fall Efficacy scale (FES) to assess fear of fall. Her study highlighted the need for fear of falling (FOF) assessments. Healthcare providers should assess FOF using subjective and objective measures as it is a major factor that affect the quality of life of elderly people (22).

Zijlstra et al. Investigated the prevalence and factors associated with fear of falling and activity avoidance in the general population of community-living older people. His study included 4,031 participants of age 70 years and above. The survey focused on evaluating both the fear of falling (Are you concerned about falling?) and the subsequent avoidance of activities due to this fear. The research revealed significant prevalence of FOF (54.3%) and avoidance of activities due to fall (37.9%) in the studied population but notably, the study underscored the strong independent association between poor perceived general health and both FOF and activity avoidance. while the current study included 99 participants with a mean age of 69 years. In com parison to Zijlstra, present study showed the strong negative correlation between the fear of and activity restriction, as fear of increases the functional independence decreases (10).

The strength of study was incorporation of Falls Efficacy Scale-International (FES-I) and the Functional Independence Measure (FIM) in study. This encouraging healthcare professionals to routinely incorporate validated tools such as the Falls Efficacy Scale-International (FES-I) and the Functional Independence Measure (FIM) in assessments can improve the identification of individuals at risk, allowing for tailored interventions. Promoting community-based initiatives that address the psychological aspects of the fear of falling, such as support groups and educational programs, may also help reduce fear of falling and its associated adverse consequences

Limitations & Recommendations:

The study has several limitations, primarily due to the small sample size, which affects the overall validity and reliability of the findings. To address this, future research with larger sample sizes and enhanced methodological rigor is recommended. Additionally, the inclusion of older adults aged 65-74, some of whom may not have a history of falls, could have influenced the study outcomes

Therefore, it is recommended the need for a more targeted approach by including population who had fall history for generalizability of results. Moreover, the focus on hospital patients and a single old age home further restricted the diversity of the participant pool. Expanding the study to include all home health communities and nursing homes across Pakistan would offer a more comprehensive and conclusive understanding of the issue.

CONCLUSION:

The study concluded that there is a significant negative relationship between the fear of falling and functional independence, as the fear of falling increases, functional independence tends to decrease, and vice versa.

Conflict of Interest: The authors declare no conflicts of interest.
Funding: his research received no specific grant or funding from any public, commercial, or not-for-profit funding agencies.

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