

Correlation Between Fear of Fall and Balance Amongst Geriatric Population - A Cross Sectional Study

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ABSTRACT

Background and aim of study: Risk of fall is most common among geriatric population. Aim of this study is to find correlation between fear of fall and balance among geriatric population.

Method: A cross sectional study was conducted on community dwelling elderly. 51 subjects (24 males and 27 females) participated after screening for inclusion and exclusion criteria. The inclusion criteria were age 60 years and above (mean=7.41, SD.=6.29), both genders, ability to comprehend English and Gujarati languages. The exclusion criteria were physical disabilities, major cardiopulmonary conditions, post-operative patient within 6 months, neurological conditions, individuals with cognitive or perceptive deficits, history of any psychiatric or psychological conditions. Subjects were explained about the study and after taking informed written consent fear of fall were measured by using Fall Efficacy Scale (FES) and balance was measured using Berg Balance Scale (BBS).

Result: The data were analyzed using Spearman correlation co-efficient to examine the relationship between FES (Mean=20.72, SD= 13.38) and BBS (Mean=47.94, SD=7.27). The correlation co-efficient between fall efficacy and balance performance was -0.539 ($P<0.05$).

Correlation between every component of FES with total score of BBS showed moderate negative correlation in components taking a bath, walking around the house and preparing meals.

Conclusion: This study concluded that there was a significant correlation between fall efficacy and balance performance.

Keywords: Fear of fall, Balance, Berg Balance Scale, Geriatrics

INTRODUCTION

Falling is the most common cause of nonfatal trauma and injuries in the elderly. Developing a fear of falling is more prevalent with increasing age and fall history, but it is not only limited to individuals with a history of falls. ^[1]

Falling risk factors are divided into two main groups: intrinsic (age-related changes, force and mobility changes, acute or chronic diseases, medication, etc.) and extrinsic (environmental). ^[2] Intrinsic risk factors including physical fitness parameters are usually the primary cause of falls. ^[3] Physical inactivity, perceived poor health, and loss of confidence can be observed as a result of Fear of fall. ^[2]

In older adults, falling can be the result of a number of physical insufficiencies, impairments, or debilitating diseases. ^[4] Individuals who have experienced falls have

significantly lower balance confidence than those who are non-fallers and are more affected by FOF. [5] Falls are a serious problem facing older adults in the community. Approximately one-third of individuals aged 65 years or older will experience a fall within a year's time, with roughly half of these individuals experiencing multiple falls. [6, 7, 8, 9]

Additionally, the combination of fall frequency and FOF has been shown to have substantial adverse effects on the physical and mental component scores of the Health-Related Quality of Life Scale. [10] Healthy aging is associated with slower cognitive processing, slower postural reactions, and decreased muscle strength, all of which are associated with balance problems. [11]

Gait and balance disorders have been cited as the second most frequent reason for falling. [4] Independent factors related to gait and balance that increase fall risk in older adults includes difficulty or inability to perform a tandem walk, slower than average gait speed. [12]

Falls among older adults are recurrent and multifactorial episodes [13, 14] therefore examining an individual at risk of falling by considering only the physical risk factors is in a sense to neglect other important aspects that cause falls, such as the fear of falling. [15]

Although the exact causes are still unclear, some authors [16, 17] agree on the multifactorial etiology of the fear of falling, which is strongly related to adverse factors including reduced quality of life, reduction in mobility, decline in functionality, increased frailty, depression, environmental factors, and institutionalization.

A sedentary lifestyle leads to reduced mobility and balance and, consequently, higher risk of falls and heightened fear that they might occur. [17] Due to the relevance of this issue among older adults, the aim of the present study was to investigate the correlation between fear of fall and balance among geriatric population.

MATERIAL & METHODS:

Materials Used:

- Pen/ Pencil
- Measurement Tape
- Chair

Methodology:

- **Sample Design:** A Cross Sectional study
- **Sample Setting:** Old age home in Ahmedabad
- **Sample Size:** 51 participants
- **Sampling Technique:** Randomized technique based on inclusion and exclusion criteria

PROCEDURE

A cross sectional study was conducted on community dwelling elderly. 51 subjects were (24 males and 27 females) participated after screening for inclusion and exclusion criteria. The inclusion criteria were age group 60 years and above (mean=7.41, SD.=6.29), both genders, ability to comprehend English and Gujarati languages. The exclusion criteria were physical disabilities, major cardiopulmonary conditions, post-operative patient within 6 months, neurological conditions, individuals with cognitive or perceptible deficits, history of any psychiatric or psychological conditions. Subjects were explained about the study and after taking informed written consent. Fear of fall was measured by using Fall Efficacy Scale (FES) and balance was measured using Berg Balance Scale (BBS).

SCALES:

THE BERG BALANCE SCALE:

The Berg Balance Scale (BBS) developed by Berg is an objective measure of static and dynamic balance abilities. The scale consists of 14 functional tasks commonly performed in everyday life. Scoring uses a five-point ordinal scale, with scores ranging from 0 to 4. Descriptive criteria are provided for scoring each level: a score of 4 is used to indicate that the patient performs independently and meets time and distance criteria, and a score of 0 is used for unable

to perform. A maximum score of 56 points is possible. The berg balance scale has a high relative reliability with inter-rater reliability estimated at 0.98 and intra-rater reliability estimated at 0.99. [18]

THE FALL EFFICACY SCALE:

The Falls Efficacy Scale (FES) was developed to measure FOF by Tinetti and colleagues. The validity and reliability of the Tinetti’s FES were tested in previous studies. There are 10 items such as “How confident are you that you can get dressed and undressed without falling?” in the scale assessing the effect of FOF on confidence in performing daily tasks. The scoring is done on a 10-point scale for each item. The total score is derived from the sum of all of questions’ scores. While ‘0’ indicates low fall-related self efficacy, ‘100’ indicates high fall. [19]

STATISTICAL ANALYSIS

Statistical analysis was done using SPSS v 16. The data were tested for normality distribution using Shapiro-Wilk test which revealed that the data were not normally distributed. Hence, Spearman’s rank correlation coefficient was used to correlate total scores of FES and BBS, to correlate scores of FES and BBS in females and correlate scores of between FES and BBS in males.

Spearman’s rank correlation coefficient was also used to find out the correlation between Age and total scores of FES and BBS.

RESULT

Total 51 subjects participated in this study. Amongst which 24 were male with (73.04 ±5.72) and 27 were female (69.96 ± 6.52).

TABLE NO.1: MEAN AND SD OF TOTAL PARTICIPANTS

Total Number of Population	Mean & SD of AGE of Male (24)	Mean & SD of AGE of Female (27)
51	73.04 ± 5.72	69.96 ± 6.52

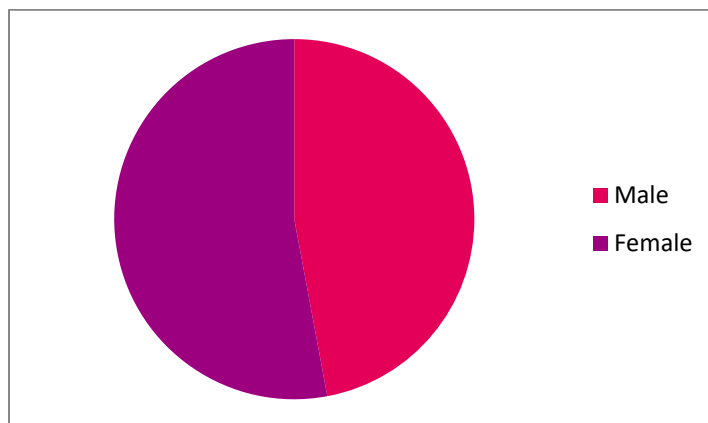


TABLE NO.2: MEAN AND SD of FES and BBS

SCALES	MEAN	SD
FES (N= 51)	20.8	13.75
BBS (N= 51)	47.94	7.27

TABLE NO.3: CORRELATION BETWEEN TOTAL SCORE OF FES AND BBS:

	Fall Efficacy Scale	Interpretation
Berg Balance Scale	-0.539 (p<0.01)	Moderate negative, Statistically significant

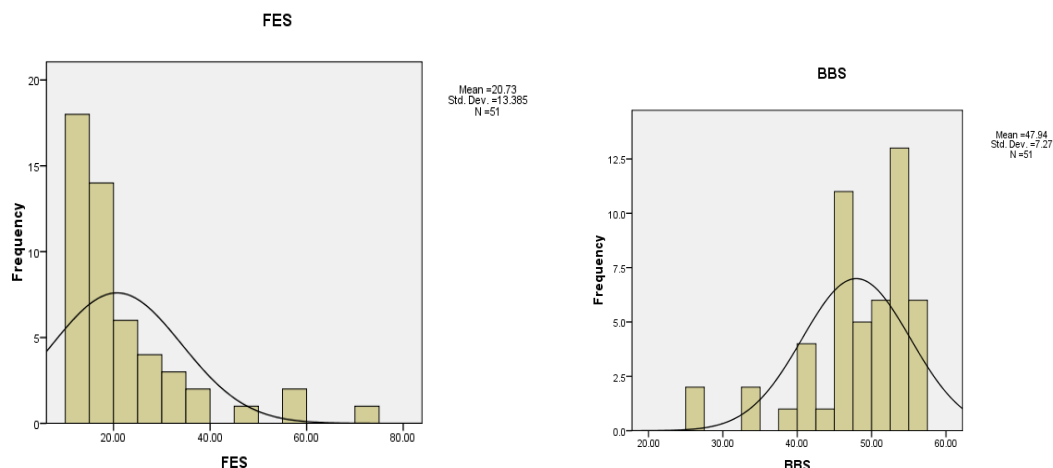


TABLE NO.4: CORRELATION BETWEEN AGE AND SCORE OF BBS AND SCORE OF FES AMONGST PARTICIPANTS

AGE (N=51)	FES (N=51)	- 0.292(p<0.01)
	BBS (N=51)	- 0.629(p<0.01)

The study showed moderate negative correlation between AGE and score BBS. There was weak negative correlation between AGE and score of FES among total 51 participants.

TABLE NO.5: CORRELATION BETWEEN FES AND BBS IN FEMALE

FEMALE	MEAN	SD	Interpretation
FES (N= 27)	20.51	13.50	(-0.629) (p<0.01) Moderate Negative
BBS (N=27)	49.44	6.27	

There is moderate negative correlation between score of FES and BBS amongst female participants.

TABLE NO.6: CORRELATION BETWEEN FES AND BBS IN MALE

MALE	MEAN	SD	Interpretation
FES (N= 24)	21.12	14.31	-0.478. (p<0.01) Moderate Negative
BBS (N=24)	46.25	8.05	

There is a moderate negative correlation between score of FES and BBS amongst male participants.

TABLE NO.6: CORRELATION BETWEEN AGE AND FES AND BETWEEN AGE AND BBS IN MALE AND FEMALE

AGE OF FEMALE (N=27)	FES OF FEMALE	- 0.452 (p<0.01)	Moderate negative
	BBS OF FEMALE	-0.611 (p<0.01)	Moderate negative
AGE OF MALE (N=24)	FES OF MALE	-0.353 (p<0.01)	Weak negative
	BBS OF MALE	-0.561 (p<0.01)	Moderate negative

DISCUSSION

The result of this study showed that fear of fall increases with advancing age and balance on the other hand decreases. This showed a negative correlation between fall efficacy and balance performance amongst elderly individuals. This revealed that individuals with fear of fall might have impaired balance.

Malina et al conducted a study reported that Older people who express fear of falling often express lower confidence in their ability to perform activities without falling than those who are not afraid and they habitually restrict the amount or type of physical activity they undertake possibly leading to further falls. [20]

The result of this study shows a moderate negative correlation between FES and BBS among geriatric population. As the score of BBS increases, the score of FES decreases amongst geriatric population.

Lopes KT et al conducted study on prevalence of fear of fall in older adult and its correlation with mobility, dynamic balance, risk and history of fall they concluded that high prevalence of fear of falling among community-dwelling older adults and a significant correlation between the fear of falling and the mobility, dynamic balance, age, risk, and history of fall of these individuals. [21]

In this study result shows a significant moderate negative correlation between score FES and BBS among female participants as well as male participants.

Radhika patil et al conducted study on 409 women aged 70-80 years. Participants were classified according to their level of concern about falling using FES-I scale, concluded that concern about falling was highly prevalent in community living older women. [22]

Merrill R et al conducted prospective study of Balance Confidence and Fear of Falling Avoidance Behavior Are Most Predictive of Falling in Older Adults so they analyzed that Balance confidence was the best predictor of falling, followed by fear of falling avoidance behavior, and the Timed

“Up & Go” Test. Fall history, presence of pathology, and physical tests did not predict falling. [23]

CONCLUSION

The study concludes that there is negative correlation between FES and BBS among geriatric population. As score of BBS was significantly increasing score of FES was decreased.

Declaration by Authors:

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Conflict of Interest: The authors declare no conflict of interest.

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