

## CORRELATION BETWEEN BODY MASS INDEX AND FEAR OF FALL ON FUNCTIONAL MOBILITY IN ELDERLY

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### ABSTRACT

**Background:** Functional mobility is defined as the ability of a person to move from place to place in the environment in order to participate in the activities of daily living. A person with overweight and obesity have a greater risk of experiencing mobility disability and those patients will have restrictions in activities at home, work, school and in the community thereby having a negative impact on their health related quality of life. Fear of falling in elderly is a major cause of loss of independence, which has an effect on the physical function in them.

**Purpose of the study:** To find out the relationship between BMI and fear of fall on functional mobility in elderly

**Result:** Out of 30 subjects, 15 subjects were overweight and 15 were normal BMI. Out of 15 overweight subjects, 53.3% were males and 46.7% were females. The mean age of overweight participants was 68.46±2.77. The mean scores for BMI were 27.82±1.56, for FOF 4.93±1.09 and for FM 21.53±3.99. FOF and FM were negatively correlated with Overweight. The correlation was not significant. Out of 15 subjects with normal BMI, 53.3% were males and 46.7% were females. The mean age of participants with normal BMI was 68.86±3.62. The mean scores for BMI were 21.40±1.61, for FOF 5.93±.883 and for FM 19.26±3.55. FOF and FM were positively correlated with normal BMI. The correlation was not significant.


**Conclusion:** The overweight individual have more fear of fall (FOF) compared with individuals with normal BMI. The functional mobility (FM) is decline in overweight individuals than individuals with normal BMI.

**Implications:** A decrease in sedentary lifestyle and regular physical activity can improve health related quality of life of elderly.

**KEY WORDS:** BMI, fear of fall, functional mobility, elderly.

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### INTRODUCTION

The aging is a natural process, mainly characterized by reduction in lean mass and increased fat mass [1]. People with the age above 65 years are considered as elderly. Years wrinkles the skin

but the anxiety, worry, fear, doubt and self distrust wrinkles the soul [2]. The common geriatric problems are impaired mobility, falls, impaired cognition, urinary incontinence, etc. falls are common events in their lives[3].

Nationally, one-third of adults >65 yr old and nearly half of those >80 yr old fall every year[4]. Interestingly fear of falling also leads to the falls. People with fear of fall change their gait, decrease their activity, or more chance to use assistive devices to prevent falling. The fear of falling leads overall decrease in strength due to decrease in activity and walking and also can lead to de-conditioning [3]. The fear of fall is not limited to people who have history of fall [5]. In many countries across the world, the prevalence of overweight and obesity in adults is increasing. Excessive body weight can cause chronic health conditions such as diabetes, cardiovascular disease, hypertension and arthritis, and can also decrease the performance in the activities of daily living [6]. When a person is able to do physical activities at home, school and in the community thereby increasing their health related quality of life [7].

One study discussed that in modern society, elderly people tend to have a high BMI due to excessive nutritional intake and low activity levels, and the relationship between falls and obesity needs to be studied continuously. People with age above 65 years show more than 25% muscle loss and approximately 50% in people over 80 years old. This change in the muscle mass affects functional movement and increases the fear of falling. Previous studies has predicted that fear of falling associated with activity limitation is a predictor of future falls, reduced functional capacity and increased dependency[8].

Due to the lack of studies on the relation between BMI, fear of fall and functional mobility in elderly, there is a need to find out the relationship. By understanding the relationship will help to improve health related quality of life of elderly that helps them to live and function independently.

## **MATERIALS AND METHODS**

This cross sectional study was conducted in elderly people fulfilling the criteria, from the tertiary hospital, Mangalore. The sample consisted of 30 community dwelling elderly people of age  $\geq 65$ . All participants were able to walk without human assistance and were able to follow the instructions given to them. The

eligibility criteria were as follows: age  $\geq 65$  years, normal weight (BMI between 18.5- 24.9 kg/m<sup>2</sup>, overweight (BMI between 25.0 - 29.9 kg/m<sup>2</sup>). Subjects who are under normal weight (BMI < 18kg/m<sup>2</sup>), Obese (BMI  $\geq 30$ kg/m<sup>2</sup>) and who had unstable cardiac disease (e.g., angina), respiratory conditions requiring oxygen supplementation or frequent use of inhalers, documented dementia or significant clinical depression, history of neurological disease (e.g., Stroke, Parkinson disease) and history of fracture within the previous 6 months (especially spinal or hip fracture) were excluded. Prior to the beginning of testing, the purpose and procedures of the study was explained to all participants and all participants provided written informed consent.

The modified falls efficacy scale (MFES) questionnaire was administered through interview. BMI of each individual was calculated and classified the individuals into overweight and obese [9]. Later the functional mobility was assessed by timed up and go test (TUG).

**Modified Falls Efficacy Scale (MFES):** The MFES scale is a visual analog scale in which items are scored from 0 to 10, with 0 meaning "not confident/not sure at all," 5 being "fairly confident/fairly sure," and 10 being "completely confident/completely sure." Total the ratings (possible range = 0 – 140) and divide by 14 to get each subject's MFES score. Scores of < 8 indicate fear of falling, 8 or greater indicate lack of fear [10].

**Timed Up and Go Test (TUG):** Participants instructed to rise from the chair an armless chair, walk 3 m forward, turn around, return, and sit down. The participants performed TUG at their usual pace. Timing was calculated from when the participant rose from the initial sitting position at the go command to return to sit down [11].

## **RESULTS**

Statistical Analysis was done using descriptive statistics. Karl Pearson's correlation coefficient test was used. A statistical package SPSS Version 17.0 was used to do the analysis and  $P < 0.05$  was considered as significant. Out of 30 subjects, 15 subjects were overweight and 15 were normal BMI.

**Table 1:** Gender distribution. Out of 15 overweight subjects, 53.3% were males and 46.7% were females.

GENDER		Frequency	Percent
Valid	FEMALE	8	53.3
	MALE	7	46.7
	Total	15	100

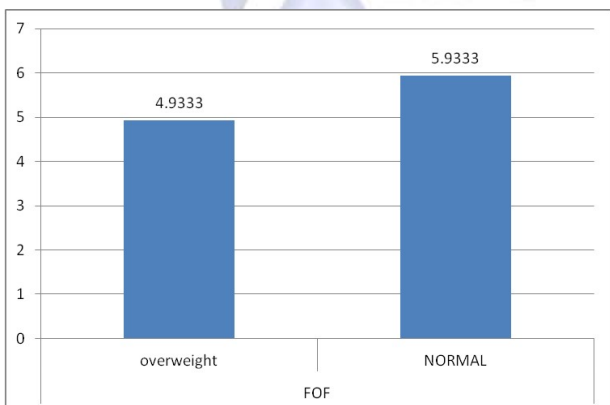
**Table 2:** Descriptive Statistics. The mean age of overweight was 68.46±2.77. The mean scores for BMI were 27.82±1.56, for FOF 4.93±1.09 and for FM 21.53±3.99.

	N	Mean	Std. Deviation
Age	15	68.4667	2.77403
BMI	15	27.82	1.56534
FOF	15	4.9333	1.09978
FM	15	21.5333	3.99762

**Table 3:** showing correlation. FOF and FM were negatively correlated with Overweight. The correlation was not significant.

		FOF	FM
Over weight	r value	-0.136	-0.113
	p-value	.629 ns	.690 ns
	N	15	15

**Fig 1:** Relationship between FOF, overweight and normal individuals. The overweight individuals have more FOF compared with individuals with normal BMI.



**DISCUSSION**

A total number of 30 elderly subjects were screened for the study from hospitals to compare the effects of body mass index and fear of fall on functional mobility. Subjects fulfilling inclusion criteria and willing to participate in the study were enrolled for the study. Data from all 30 subjects were analyzed. Modified falls efficacy scale (MFES) was used to assess fear of fall and functional mobility was measured by Timed up and go test (TUG).

The aging is associated with important changes in the body. Increased body fat can compromise the health and quality of life. Excessive weight is a growing and costly problem that requires

**Table 4:** Gender distribution. Out of 15 subjects with normal BMI, 53.3% were males and 46.7% were females.

GENDER		Frequency	Percent
Validity	FEMALE	8	53.3
	MALE	7	46.7
	Total	15	100

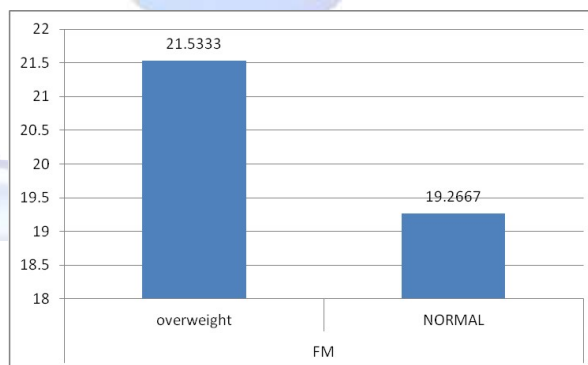
**Table 5:** Descriptive Statistics. The mean age of normal BMI was 68.86±3.62. The mean scores for BMI were 21.40±1.61, for FOF 5.93±.883 and for FM 19.26±3.55.

	N	Mean	Std. Deviation
Age	15	68.8667	3.62268
BMI	15	21.4067	1.61487
FOF	15	5.9333	0.88372
FM	15	19.2667	3.55501

**Table 6:** showing correlation. FOF and FM were positively correlated with normal BMI. The correlation was not significant.

		FOF	FM
Normal BMI	r value	0.221	0.148
	p-value	.430 ns	.599 ns
	N	15	15

**Fig 2:** Relationship between FM, overweight and normal individuals. The functional mobility (FM) is declined in overweight individuals than individuals with normal BMI.



public attention. Mobility is a person’s ability to move him or herself independently and safely from one place to another. Mobility limitations hinder the ability to manage tasks of daily life and may lead to the need for help and an increased risk for disability. The fear of falling is one of the most significant factors that increase the risk of fall and it can lead an individual to avoid activities that he/she remains capable of performing. It is a serious and common problem among aging individuals.

The result of this study showed the association between BMI, fear of fall and functional mobility in the elderly people is not statistically significant. Among 30 elderly people, the

functional mobility (FM) is decline in overweight individuals than individuals with normal BMI.

The results of study are comparable with the results of other studies in this area. E Zoico.et.al conducted a study that shows high body fat and high BMI values were associated with a greater likelihood of functional limitation in a population of elderly women at the high end of the functional spectrum [12].

Jenkins KR suggested that several studies have analyzed the relationship between body weight and functional impairment showing that extreme high or low body weight is associated with poorer physical functioning [9].

Present study showed that the overweight individual have more fear of fall (FOF) compared with individuals with normal BMI.

Suraj kumar.et.al mentioned in their study that fear of falling change the gait, decrease the activity or increase the use of assistive devices in elderly. The worst consequences of fear of falling are decreased activity and walking [3]. Susan L. Murphy.et.al identified the predisposing factors for the development of fear of falling are age 80 years or older, visual impairment, a sedentary lifestyle and no available emotional support [13]. Kim Delbaere.et.al concluded in their study that the avoidance of activities are the major consequence of fear of fall [14].

Further study should focus on BMI, fear of fall and functional mobility in wide samples of subjects. This relationship can help the well being of elderly.

## CONCLUSION

This study has shown that overweight individuals aged 65 years and older have decreased functional mobility and increased fear of fall than normal individuals. This result can provide information for developing rehabilitative programs to improve health related quality of life of elderly that helps them to live and function independently. Further research is required to expand the relationship of the current study.

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## ABBREVIATIONS

**BMI** - Body mass index

**FOF** - Fear of fall

**FM** - Functional mobility

**MFES** - Modified fall efficacy scale

**TUG** - Timed up and go test

**Conflicts of interest: None**

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