ORIGINAL ARTICLE

Applicability of Activities Listed in Modified Falls Efficacy Scale (MFES) In Indian Elderly

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ABSTRACT

Background: Falling is a major public health concern among the elderly. Fear of falling (FF) is a significant issue leading to the self-avoidance of regular physical activities, and the Modified Falls Efficacy Scale (MFES) measures the fear of falls in the elderly. However, in MFES, out of 10 indoor and 4 outdoor activities, not all activities are relatable to the Indian population. In contrast, some typical activities with a high risk of falls are not included. Hence, the study aims to assess the applicability of activities listed in MFES in the Indian elderly.

Methods: 104 elders, both males and females, from the community and institutions were evaluated. The MMSE and Geriatric Depression Scale were evaluated for cognition and depression symptoms. The risk of falls was assessed with TUG. Subjects were interviewed with MFES about their confidence level and the applicability of activities. Subjects were asked about any other activity that gives them fear of falls, which was not in MFES.

Results: Pearson's Chi-square test revealed significant values (p<0.05) in the correlation of factors affecting falls with locality and gender and the correlation of some activities in MFES with locality and gender. The association of TUG and MFES revealed a negative correlation (p<0.001).

Conclusion: Seven indoor activities and three outdoor activities were applicable for all participants. Three indoor and one outdoor activities were gender-specific and were done by females and males, respectively. 'Answering the telephone' and 'light gardening' were found totally inapplicable, while seniors reported some other activities with fear of falls. Developing a new fall efficacy scale for Indian Elders will be beneficial.

Keywords: Elderly, fear of falls, efficacy, risk of falls, timed up and go.

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INTRODUCTION

India is the most populated country in the world [1]. Also, it has a large elderly population, which is estimated to be 100 million presently and expected to grow to 140 million by 2030 and 324 billion by 2050 [2]. Among the significant public health concerns, falls in older people is a serious issue. Annually, approximately 684,000 individuals die from falls around the world, with over 80% reported in low- and middle-income nations [3]. Falls in the elderly may result in some serious injuries or even death. Falls in the elderly result in loss of independence and confinement in assisted living care [4]. In India, the rural elderly population is estimated at 69%, whereas the urban elderly population is at 31% [5]. The inequalities in the urban and rural health services further increase the care burden.

Fear of Falls (FoF) is one of the risk factors for falls. According to research, 26-55% of elderly living in the community have a fear of falls. Among those who have fallen, 40-73% report fear of falling. Most importantly, about half of those who reported fear of falls had never fallen [6]. It has been found that community-living elderly ranked Fear of falling as their highest concern [7]. It has been reported that fear of falling affects human postural control [8], reduces gait performance [9], and leads to activity limitation [10]. A correlation between Fear of falling and avoidance of activities was also found among community-dwelling older adults. Avoidance would lead to self-restriction of activities, and the decline in physical functioning might elicit even more Fear of falling [11]. Restricted functional activities have been shown to cause deconditioning, resulting in muscle atrophy, lower aerobic capacity, altered balance, social isolation, depression, increased fall risk, and a negative impact on QOL [12].

In 1990, Tinetti et al. [13] developed the Falls Efficacy Scale (FES) to assess the fear of falls and the risk of falls while doing activities in older people. The tasks are indoor activities that apply only to frail elderly and very old adults, so they are too easy for the more active and healthier people [14]. Hill K.D. et al. developed a 14-item Modified Falls Efficacy scale, an expanded version of Tinetti's FES, and included four outdoor activities [15]. Both scales were criticized for assessing the fear of falls in a continuum of 0 to 10, as the marginal differences in the visual analog scale will not give meaningful differences in the elderly population. In an attempt to develop a scale applicable across different cultures, Yardley et al. developed the Falls Efficacy Scale – International in 2005. It included a comprehensive list of daily tasks and rates the fear of falling on a four-point scale [16].

All the above falls efficacy scales were developed in the Western part of the world, keeping in mind the lifestyle of those countries. While translating and validating the MFES scale in Hindi and Gujarati, it was found that the Indian elderly do not perform some of the tasks listed in the MFES. Also, some of the activities that are frequently done by older people but have reported fear of falls while performing those activities were not included, e.g., squatting. The literature review also suggested that a questionnaire that assesses the fear of falls in the Indian subcontinent or Asian region is very sparse. It is essential to identify how many tasks listed in the scales are relevant to the Indian elderly to evaluate their fear of falls, thereby making accurate predictions.

METHODS

The study was approved by the Sumandeep Vidyapeeth Institutional Ethics Committee (SVIEC/ON/PHYS/PHD/16/NOV/1717020) and was registered with the Clinical Trials Registry of India (CTRI/2018/05/013809). People aged 60 and above, both genders, were recruited until the saturation point was reached in identifying the additional activities that can cause the fear of falling in older people. Subjects were recruited from Urban and rural backgrounds who lived in the Vadodara district and also from nursing homes and elderly living in institutional care. The purposive Sampling method was used.

All the chosen senior older adults were given a patient information sheet containing the details of the study. Also, they were explained about the study on a one-to-one basis. Written informed consent was obtained from those who volunteered to participate. All the subjects underwent routine neurophysiotherapy and MMSE examinations and answered a 15-item GDS. Inclusion Criteria included subjects of both genders who were 60 years and above and could ambulate with or without walking aids. Subjects whose score was less than 24 in the Mini-Mental Scale Examination (MMSE) and who scored six or more in the 15-item Geriatric Depression Scale (GDS) were excluded. Also, subjects who were suffering from known medical conditions that can cause balance issues, like stroke and Parkinson's disease, were excluded.
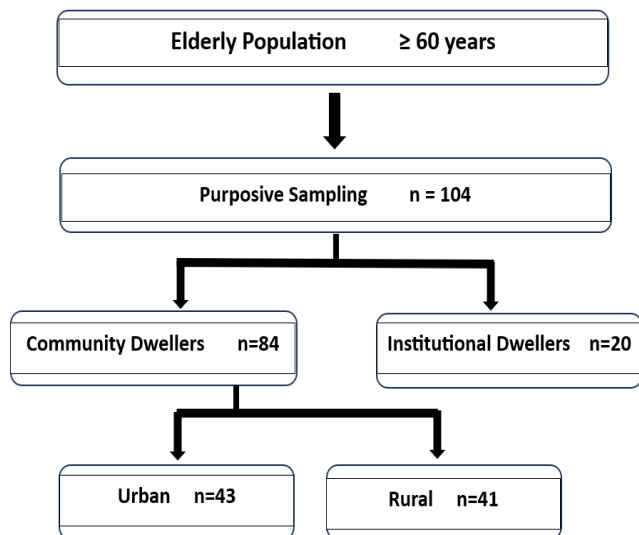
The subjects were given MFES in their language choice (English, Hindi, or Gujarati) and were asked to rate their fear of falls in the MFES activities. The Hindi and Gujarati translations of MFES were translated and validated prior. If the seniors did not perform any activity mentioned in the MFES, they were asked to leave blank for that activity. They were also asked about the frequency of likelihood of doing each activity on a 4-point scale (quite often, often, rarely, and very rarely). If any subject had a low literacy level, then the MFES was filled out by interview method, and the investigator answered the participants' questions if they had any.

Following MFES, all the participants underwent the Timed Up and Go test (TUG) described by Podsiadlo & Richardson. All the subjects sat on a chair at the beginning, got up from the chair after being instructed, walked for 3 meters, turned around, came back, and sat back on the chair. Timing was calculated using a stopwatch, and timing started once the "Go" instruction was given, and the timer was stopped when their buttocks touched back on the chair. All the data were entered into an Excel sheet for data analysis.

RESULTS

One hundred four elderly people participated in the study, of which 53 were females and 51 were males. Forty-nine participants (male 20, female 29) were in the age group of 60 to 69, 37 (male 20, female 27) from the age group of 70 to 79, and 18 (male 11, female 7) participants from the age group of 80 and above. Forty-three subjects are from Urban backgrounds, 41 are from Rural, and 20 are from nursing homes or institutional care (Fig. 1).

Out of 104 participants, 77 perceived their lifestyle as active, while 27 reported as sedentary. Fourteen subjects reported that they had a fall more than once in the previous year. Table 1 describes the Mean and standard deviation of Age, MMSE, GDS, and TUG scores. Rural people reported being more physically active, whereas urban elderly consumed four or more medications during the study. In urban and rural localities, people reported almost equal amounts of fear of falls and avoiding activities due to fear of falls. Table 2 describes the factors that can affect the balance and the risk of falls in the elderly in terms of the area background and the gender aspects.

Figure 1: Flow chart of participant recruitment

Table 1. Descriptive statistics of 104 elderly participants of the study

n=104	Minimum	Maximum	Mean	SD
Age (in years)	60	97	71.90	7.901
MMSE	24	30	26.14	3.957
GDS	0	5	2.41	1.681
TUG (in Seconds)	4.57	57.10	16.2926	8.39301

Table 2: Describes the factors that can affect balance and the risk of falls in elderly people in terms of the area background and gender aspects.

Locality	Rural (n=41)	Urban (n=43)	Difference in %	Institutional (n=20)	p - value	Male (n=51)	Female (n=53)	Difference in %	p-value
Physically active	92.7% (n=38)	58.1% (n=25)	34.60%	70% (n=14)	0.001	54.9% (n= 28)	92.5% (n=49)	-37.60%	0.000
Health conditions interfering daily activities	90.2% (n=37)	53.5% (n=23)	36.70%	90% (n=18)	0.000	66.7% (n=34)	83% (n=44)	-16.30%	0.054
Health conditions interfering social activities	90.2% (n=37)	48.8% (n=21)	41.40%	95% (n=19)	0.000	62.7% (n=32)	84.9% (n=45)	-22.25%	0.01
Exercising	9.8% (n=4)	44.2% (n=19)	-34.40%	0% (n=0)	0.000	25.5% (n=13)	18.9% (n=10)	6.60%	0.416
Taking medications more than 4 (polypharmacy)	61% (n=25)	74.4% (n=32)	-13.40%	100% (n=20)	0.005	66.7% (n=34)	81.1% (n=43)	-14.40%	0.093
Using walking aids	9.3% (n=4)	9.8% (n=4)	-0.50%	40% (n=8)	0.003	15.7% (n= 8)	15.1% (n=8)	60.00%	0.933
Afraid of falling	81.4% (n=35)	85.4% (n=35)	-4.00%	80% (n=16)	0.837	72.5% (n=37	92.5% (n=49)	-20.00%	0.007
Avoiding activities	85.4% (n=35)	86% (n=37)	-0.60%	85% (n=17)	0.993	76.5% (n=39)	94.3% (n=50)	-17.80%	0.01
Problem with balance/ walking since 1 year	61% (n=25)	51.2% (n=22)	9.80%	65% (n=13)	0.504	51% (n=26)	64.2% (n=34)	-13.20%	0.174
More than 1 Fall in last 1 year	12.2% (n=5)	27.9% (n=12)	-15.70%	55% (n=11)	0.002	23.5% (n=12)	30.2% (n=16)	-6.70%	0.444

In MFES, 42% of the participants responded that they don't do simple shopping, 60% don't perform light housekeeping, and 77% don't hang out the wash. No subject was doing gardening. Only 33% were involved in preparing a simple meal, and all were females (62% of females). 63.5% of the participants responded that they use public transport. Pearson's Chi-square test revealed statistically significant values ($p < 0.05$) in the correlation of the factors affecting falls with locality and gender, as well as the correlation of some of the activities in MFES with locality and gender (Table 3). The association of TUG and MFES revealed a negative correlation ($p < 0.001$, Fig - 2).

Figure 2: Correlation between MFES and TUG

Correlation MFES v/s TUG
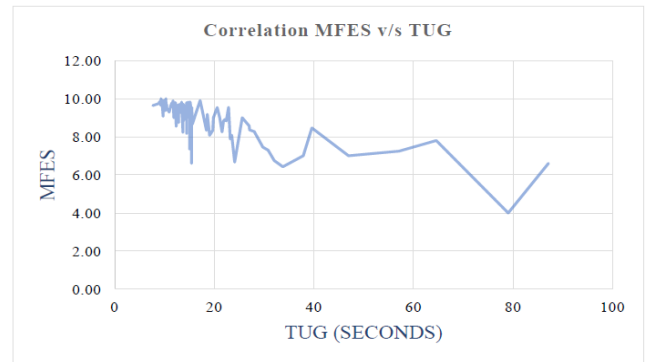
Table 3: Describes the frequency of performing the tasks listed in the MFES in terms of the area background and the gender aspects.

MFES	Frequency (n=104)		Rural (n=41)	Urban (n=43)	Difference in %	Institutional (n=20)	p-value	Male (n=51)	Female (n=53)	Difference in %	p-value
Getting dressed and undressed	103	99.00%	100% (n=41)	100% (n=43)	0%	95.0% (n=19)	0.120	98.0%(n=50)	100% (n=53)	-2%	0.306
Prepare a simple meal	33	31.70%	31.7% (n=13)	41.9 (n=18)	-10.20%	10.0% (n=2)	0.041	0% (n)	62.3% (n=33)	-62.30%	0.000
Take a bath or shower	104	100%	100% (n=41)	100% (n=43)	0%	100% (n=20)	†	100% (n=51)	100% (n=53)	0%	†
Get in/out of a chair	102	98.10%	95.1% (n=39)	100% (n=43)	-4.90%	100% (n=20)	0.209	100% (n=51)	96.2% (n=51)	3.80%	0.161
Get in/out of a bed	104	100%	100% (n=41)	100% (n=43)	0%	100% (n=20)	‡	100% (n=51)	100% (n=53)	0%	‡
Answer the door or telephone*	96	92.30%	100% (n=41)	95.3% (n=41)	4.70%	70.0% (n=14)	0.000	90.2% (n=46)	94.3% (n=50)	-4.10%	0.428
Walk around the inside of your house	100	96.20%	97.6% (n=40)	100% (n=43)	-2.40%	85.0% (n=17)	0.013	94.1%(n=48)	98.1% (n=52)	-4%	0.298
Reach into cabinets or closet	103	99%	100% (n=41)	100% (n 43)	0%	95.0% (n=19)	0.120	98.0% (n=50)	100% (n=53)	-2%	0.306
Light housekeeping	41	39.40%	46.3% (n=19)	41.9% (n=18)	4.40%	20.0% (n=4)	0.130	9.8% (n=5)	67.9% (n=36)	-58.10%	0.000
Simple shopping	61	58.70%	73.2% (n=30)	51.2 (n=22)	22%	45.0% (n=9)	0.047	70.6% (n=36)	47.2% (n=25)	23.40%	0.015
Using public transport	66	63.50%	68.3% (n=28)	51.2 (n=22)	17.10%	80.0% (n=16)	0.062	60.8% (n=31)	66.0% (n=35)	-5.20%	0.578
Crossing roads	93	89.40%	90.2% (n=37)	95.3% (n=41)	-5.10%	75.0% (n=15)	0.049	92.2% (n=47)	86.8% (n=46)	5.40%	0.374
Gardening or hanging out the wash**	34	32.70%	36.6% (n=15)	41.9% (n=18)	-5.30%	5.0% (n=1)	0.012	5.9 (n=3)	58.5% (n=31)	-52.60%	0.000
Using front or rear steps at home	94	90.40%	100% (n=41)	90.7% (n=39)	9.30%	70.0% (n=14)	0.001	88.2% (n=45)	92.5% (n=49)	-4.30%	0.466

*Answering the telephone was not relevant to any participant. Gardening was not relevant to any participant. †Taking a bath or shower is constant. ‡Getting in/out of the bed is constant.

DISCUSSION

Falls efficacy scales, particularly FES-International, are found to be valid and reliable instruments across cultures, not only in European countries but also in Arabic17, Persian (Iran)18, and China19. However, these studies have used the translated version with some adaptation and studied its validity only rather than investigating the items in context to their subjects' living styles.

In its global report on fall prevention in older age, WHO [20] states that among the two cross-cutting determinants in active aging, Culture is one of the determinants, with Gender being the other. The sedentary lifestyle of the elderly, as they are meant to rest, and poor design of public and private spaces, such as steps without handrails and shining floors, are results of cultural preferences. Culture also contributes to the stigma of requesting help where that is needed or even unavoidable, and this leads to risk-taking behavior, increasing the risk of falls. In a Turkey study, Meltem Halil et al. note that the risk factors are different in a local situation than in the literature, and they attribute these discrepancies to the differences between cultures, mainly lower educational status and wider family support of the elderly [21]. The present study also notes that most elders perform seven of the ten indoor tasks. Most of these activities are related to their daily living (ADL), ambulation, and basic fitness. Older people did not perform light housekeeping, hang out the washing, and prepare a simple meal. The first two tasks are considered hard work and are done mainly by the young people in the family. The participants from the nursing home don't perform at all. Preparing a simple meal, which is again not performed by the old age home participants, also was not performed by the males in the community-dwelling subjects. Similarly, in outdoor activities, many subjects do not perform simple shopping, and those doing it are predominantly males. Cultural practices significantly impact an individual's role in the family and, thereby, the tasks that are performed in day-to-day life.

The subjects of the present study have reported fear of falls in performing certain activities like getting up from the floor, bending forward to pick up an object from the floor in a standing position, riding a bicycle or two-wheeler with or without a pillion rider, and moving in a crowded place. These activities are not listed in the MFES. While developing the Geriatric Fear of Falling Measure (GFFM) for the Taiwanese elderly, Tzu-Ting Huang comments that it is essential to identify the variables that cause fear of falling and gain a fresh perspective in the context of local needs [22]. While developing a new fear of falling scale, Hong Kong Sheung Lin Kuo notes that all the existing fear of falling scales were developed concerning the authors' origin country lifestyle, and none of them reflect the Asian lifestyle [23]. In India, especially in rural areas, squatting is the most common position adopted for toileting. Also, the elderly sit on a low stool while taking a bath due to safety concerns, and sitting on the floor is practiced while worshipping God at home. The lack of facilities makes the rural elderly sleep on the floor. The above activities force older people to get up from the floor.

Participants could not participate in activities such as 'answering the telephone' and 'light gardening' since landline telephones are obsolete in India and gardening is not widely performed due to environmental constraints. Participants reported that they perform certain activities like using front or rear steps at home and reaching into cabinets or closets regularly. However, they have a significant fear of falls in performing them.

The present study showed a significant negative correlation was observed between TUG and MFES ($p < 0.001$). A lower score on the Falls efficacy scale was linked to faster TUG timings, indicating less fear of falls in performing daily activities, and is linked to good balance and mobility [24].

CONCLUSION

Seven out of the ten indoor activities and three out of the four outdoor activities were performed by the Indian seniors. They report a high fear of falling in some activities, like using the front or rear steps at home and reaching into cabinets or closets. Many subjects did not perform three indoor activities and one outdoor activity. Simple shopping, Light housekeeping, hanging out the washing, and preparing a simple meal are those activities, and preparing a simple meal is predominantly gender-specific in the Indian setup. Gardening and answering the telephone were irrelevant to the Indian elderly, considering the environmental constraints and the available technology. Indian elderly report that they fear falls when doing activities like getting up from the floor, picking up objects from the floor while standing, and moving in a crowded place, which is not listed in the MFES. Despite these pitfalls, MFES was still significant in assessing the risk of falls in the elderly. Indian population is culturally and socially distinct from the Western population, so the development of a scale that assesses the fear of falls in Indian elderly with tasks that are more appropriate to the culture and with a high frequency of performance in daily living will help to effectively assess the fear of fall and accurately predict the risk of falls.

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