

Association of Frailty with Gender, Balance, and Cognition in the Elders of Ahmedabad, India



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Abstract

Context: Frailty is age-related reduction in functioning of physiological systems causing poor health outcomes.

Aims: To find association of frailty with gender, balance, and cognition. Settings and Design: An observational, analytical study was done in outpatient physiotherapy department, residential areas and old age homes.

Methods and Material: Two hundred people were screened by principal investigator using Tilburg Frailty Indicator (TFI). Individuals found frail according to criteria of the questionnaire, did the timed up and go (TUG Test). Mini Mental State Examination (MMSE) was taken to assess cognition. Statistical analysis: Association of frailty scores with gender was tested using Chi-square test, correlation of frailty (TFI score) with cognition (MMSE score) and balance (TUG test) was found using Spearman's correlation.

Results: From 200 elders screened 26.5% were found to be frail. The mean score of the TFI was 3.23 ± 2.15 . Correlation of frailty (TFI) with cognition (MMSE) was $r = -0.33$, $p = 0.015$. Correlation of frailty (TFI) with balance (TUG) was $r = -.13$, $p = 0.35$ suggested no correlation between the two variables. There was difference in prevalence of frailty in females as compared to males $\chi^2 (1) = 0.80$ ($p < 0.05$), (95% CI 3.98 to 28.14).

Conclusion: The present study shows 26.5% prevalence of frailty. There is association of frailty with gender. There is moderate correlation of frailty with cognition. No correlation between frailty and balance was seen.

Keywords: Cognition; Musculoskeletal Condition; Frailty; Geriatric Syndrome

Introduction

According to a recent report, by 2030, one in six people would be >60 years of age. By 2050 the population aged >60 years would be 2.1 billion [1]. This transition would increase age-related disorders and associated burden.

Frailty is a geriatric syndrome having multisystem dysregulation, reduction in physiological, cognitive, and functional reserves making person vulnerable to adverse outcomes [2]. Early screening of frailty would help monitor population health, identify high risk groups, prevent adverse events, and implement health policies [3]. This study was undertaken to find association of frailty with gender, balance, and cognition.

Subjects and Methods

Ethics approval of the Institutional Review Board was taken. We screened 200 adults above 65 years of age who could ambulate independently with or without an assistive device, who were not

wheelchair bound, and who did not have any known/diagnosed neurological/oncological/psychiatric condition irrespective of the fact they were or were not taking treatment. People with diagnosed musculoskeletal condition with pain NPRS >7 were excluded. The older people were explained the study, and those willing to participate were included. Voluntary signed informed consent was taken from all adults who were included in the study.

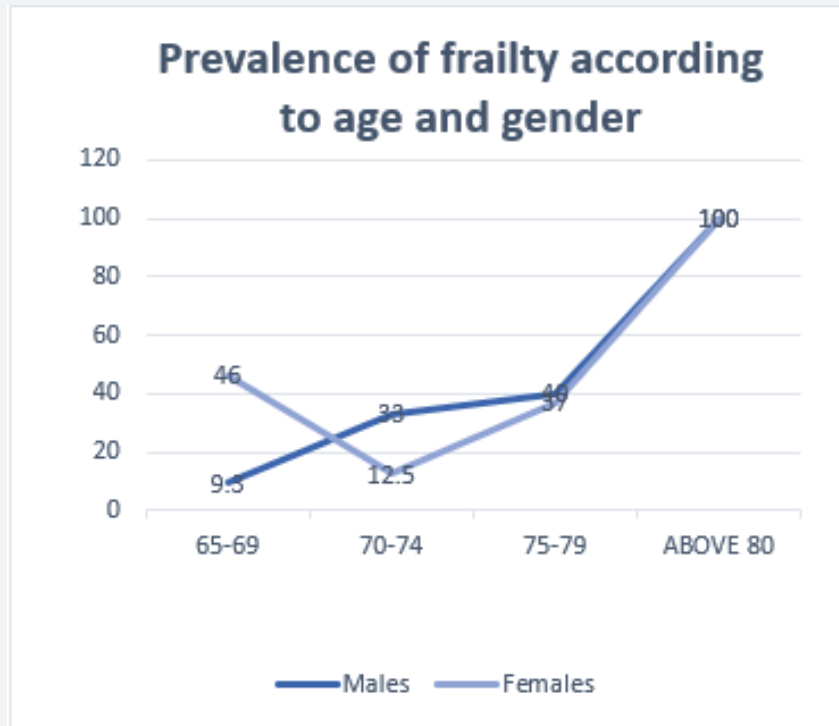
The principal investigator who was fluent in English and other local languages asked the questions of Tilburg Frailty Indicator. If the person was found to be frail, they were made to undergo TUG-test to screen balance and then their cognition was tested with MMSE scale.

Statistical analysis: Correlation of frailty (TFI score) with cognition (MMSE score) and balance (TUG test) was found using Spearman's correlation. Association of frailty scores with gender was tested using Chi-square test. 95% confidence interval was considered along with level of significance of 5%.

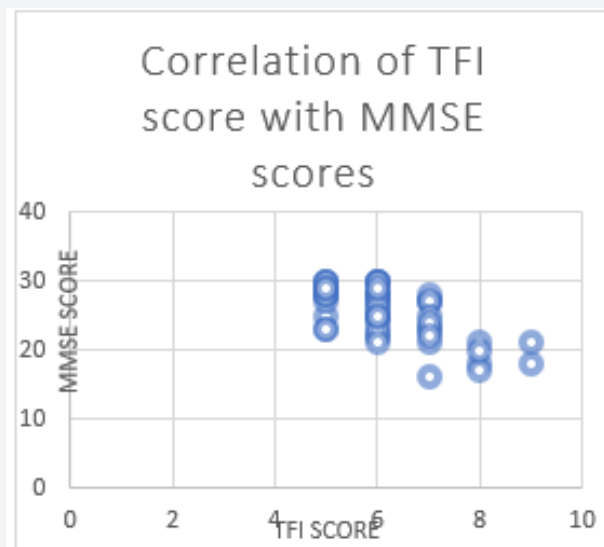
Results

From the 200 people screened, 39 people were from old age home. The mean age of the population was 71.87 ± 5.62 years, 98 women and 102 men were assessed. From the 200 geriatric

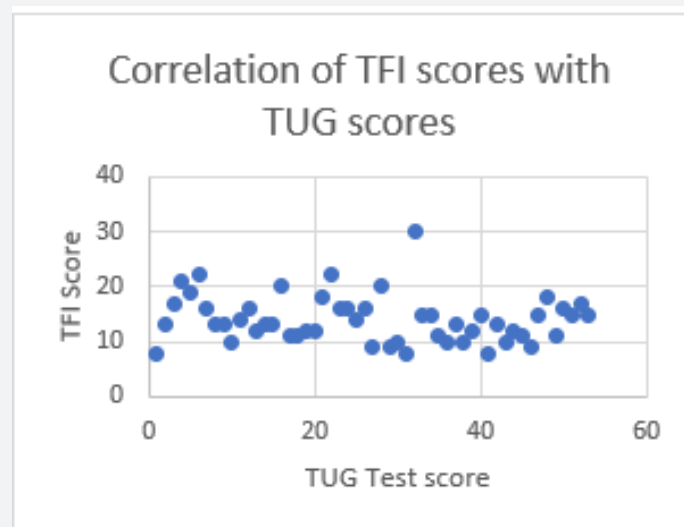
people screened 26.5% were found to be frail. The mean score of the Tilburg Frailty Indicator was 3.23 ± 2.15 . Out of the 98 women screened 36 (36.7%) were found to be frail (95% CI 25.26 to 44.11). The proportion of frail men out of 102 men screened was 19 (18.6%) (95% CI 11.07 to 26.1).



Graph 1: Prevalence of Frailty with gender.



Graph 2: Correlation of TFI scores with MMSE scores.



Graph 3: Correlation of TFI scores with TUG scores.

We found that 49% of frail population and 44% of robust or pre-frail population were living without a spouse. Among people who were found to be frail, the components physical tiredness and memory problem were the highest affected (77.3%). Physical tiredness was the highest affected physical component among the frail population (77.3%) whereas negative feeling of physical health was the highest affected component among pre and non-frail population (94.6%). Problems with memory were the highest prevalent psychological component among the frail (77.3%) and non or pre-frail population (32.6%).

Only 3% of the total population and 5% of frail population screened had the issue of inability to cope with life problems. Among the non or pre-frail people, 2.7% had the complain of not receiving enough support whereas 13.2% frail people had this issue. Feeling of loneliness or missing having people around, was the highest prevalent social component among frail (26.4%) and non or pre-frail population (19.04%). Graph 1 shows the prevalence of frailty with gender and cognition. Graph 2 shows the correlation of TFI scores with MMSE scores. The correlation of frailty (TFI scores) and cognition (MMSE score) was $r = -0.33$, $p = 0.015$. Graph 3 shows the correlation of TFI scores with TUG scores. The correlation of frailty (TFI scores) and balance (TUG test) was $r = -0.13$, $p = 0.35$. The correlation between the total score of physical components of frailty and TUG test was. ($r = 0.46$, $p < 0.00$).

Discussion

The study was conducted to find the prevalence of frailty in elders of Ahmedabad, which was found to be 26.5%. Incidence of prefrailty and frailty were found to be significantly higher in

women than men. There is moderate association of physical frailty with balance and frailty with cognition.

The prevalence of frailty in other states of India was to 32.3% [4] in Rajasthan, 38.8% in West-Bengal [5], 24.7% in Bengaluru, Karnataka [6], 47.3% in Haryana [7] and 26.6% in Pune, Maharashtra [8]. This interstate difference is due to the diversity in culture and lifestyle of each city/state. In United States the prevalence of frailty among community dwelling veterans was 20.84% [9]. In England the prevalence of frailty among adults' ≥ 65 years was 43.7% and it was found to increase with age [10]. Similar trend of increasing prevalence of frailty with age was found in our study.

In the current study we found that prevalence of frailty and pre-frailty was higher in women than men. Kashikar et al had found no association of gender with frailty [8] and Rath et al [7] have found that female gender was associated with frailty. Similar results were found by Kane et al [11] that females are found to be frailer which is similar to the present study. It is found that women live longer than men but have poorer health status. Even in developed countries, the environment is more adverse for women, and lifestyle factors may increase women's vulnerability to stochastic subcellular events that increase recovery time making them more frail [12]. In the current study we found that frailty was not associated with balance but only the physical components of frailty are moderately correlated with balance. Meratwal et al found that prevalence of falls was 2.67 times more in frail elders than in robust elders [4]. In a recent systematic review it was found that fear of falls is associated with frailty in community dwelling adults [13].

In the current study we found moderate correlation of frailty with cognition. Wang et al had done a study in Beijing and found people who were frail were more likely to develop cognitive impairment and baseline frailty status is an indicator for mild cognitive impairment [14]. Such associations of frailty and cognition has led to the term “cognitive frailty” which signified decline in physical and cognitive functions, and it has been found that people with cognitive frailty are at higher risk of dementia than people with mild cognitive impairment or physical frailty [15]. We have used a self-reported subjective questionnaire to screen frailty- Tilburg frailty Indicator which may have created a potential bias, as is the case with all self-administered, subjective screening tools. However, it is a reliable and valid tool for the same. Change in health policies and inclusion of the topic in physiotherapy academic syllabus is needed for earlier screening of frailty to prevent adverse events and reduce the financial burden on the developing country.

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