

# Evaluation of Frailty in Community Dwelling Older Adults of India

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## ABSTRACT

**BACKGROUND:** Frailty is a major syndrome associated with ageing. It results from cumulative decline across multiple physiological systems which is different from that occurs in normal ageing. Frail older adults are vulnerable to adverse health outcomes including falls, incident disability, hospitalization, and mortality following any minor stressors e.g. infection. Identification of such older adults is important for prevention and treatment of poor health consequences of frailty.

There are only few studies that have assessed frailty among older adults in India, thus present paper aims at providing community based prevalence and socio demographic and health related factors associated with frailty.

**METHODOLOGY:** Two hundred sixteen community dwelling older adults of age more than 60 years were selected using convenience sampling. Subjects having neurological disorder, and communication impairments were excluded. The assessment for frailty was done with Edmonton Frail scale (EFS).

**RESULTS:** Out of two hundred sixteen older adults, the percentage of subjects with a robust or non frail score (0–4) on the EFS was 28.2% and 40% had an apparently vulnerable score (5–6), and 31.8% had a frail score (7–17). Age, gender and number of comorbidities was significantly associated with Frailty ( $p < 0.05$ ). However, no significant associations were observed according to education level.

**CONCLUSION:** There are high percentage of frail older adults. Screening for frailty shall be incorporated in Geriatric evaluation as it carries risk of poor health consequences.

## 1. Introduction

Frailty is a common syndrome carrying adverse health outcomes in older adults. It is characterized by decrease in multiple physiological systems at the cellular level and decrease in homeostasis resulting in increased risk of the falls, dependency, disability, hospitalization and mortality.<sup>(1,2,3)</sup> Frailty is a concept which includes physical, psychological and social components. It is due to accumulation of pro inflammatory responses, secretion of interleukin-6 and other cytokines which leads to cell death and senescence. It is different from the normal ageing, in terms of poor resolution of homeostasis and causing functional dependency after any stressor event such as infection, fall or surgery. The result of frailty is loss of functional capacity and less energy reserve in day to day activities.

There are various definitions and measurements acceptable for assessment of frailty that can be used. Fried's Frailty Phenotype is a popular measurement of frailty. Other evaluation scales are: Frailty Index of Accumulative Deficits (FI-CD), Study of Osteoporotic Fractures (SOF) Index, Edmonton Frailty Scale (EFS), Clinical Frailty Scale (CFS) etc.<sup>(4,5)</sup>

As frail older adults are at risk of having poor health consequences, thus identification of such people is important for the prevention of frailty and planning effective plan of care. Prevalence of frailty have been reported by various countries. A systematic review by (Collard, 2012) found the prevalence of frail older adults in community between (4.0 - 59.1%) which increased with increasing age.<sup>(6)</sup> A multi country analysis on patterns of frailty in the countries of China, India, Mexico

Ghana, Russia and South Africa reported prevalence of 44.5% in India.<sup>(7, 8)</sup>

The present study was undertaken as only few studies have investigated prevalence of frailty and its association with various factors on Indian population.

## 2. Methodology

This is cross sectional study design. Two hundred sixteen older adults from different areas of the city Ahmedabad were selected using convenient sampling. Study included males and females of more than 60 years of age and willing to participate. Subjects having neurological disorder and communication impairments were excluded. An explanation about the study method was given and written consent was taken from subjects.

## 3. Outcome measures

For the assessment of frailty, Edmonton Frail Scale (EFS) was used. It is a valid and reliable measurement tool for the identification of frail. The EFS is scored out of 17, and contains nine components which covers all the major factors predisposing for frailty. The components assessed in EFS are cognition, general and self health status, functional independence, social support, medication use, nutrition, mood, incontinence and functional performance.<sup>(9, 10)</sup>

Out of the nine components, cognition and functional performance are examined with performance based tests. For cognition, clock drawing test and Timed up and Go test for functional performance is used. Component scores are summed and the following cut off scores are used to classify frailty severity: not frail/robust (0–5); apparently vulnerable

(6–7); mildly frail (8–9); moderately frail (10–11) and severely frail (12–17) (Rolfson et al, 2006)

In this study, the EFS score was stratified in 3 Groups : Robust or Non frail (0-4 points), Apparently vulnerable (5-6 points), and Frail (7-17 points).

Data was also collected on sociodemographic variables, including age, gender, education level (less than 10 years or more than 10 years of education) and number of comorbidities (hypertension, diabetes mellitus, heart disease).

Prevalence ratios were calculated. Chi square test were used to analyze association between sociodemographic factors and number of comorbidities with frailty. Level of significance was at 5%.

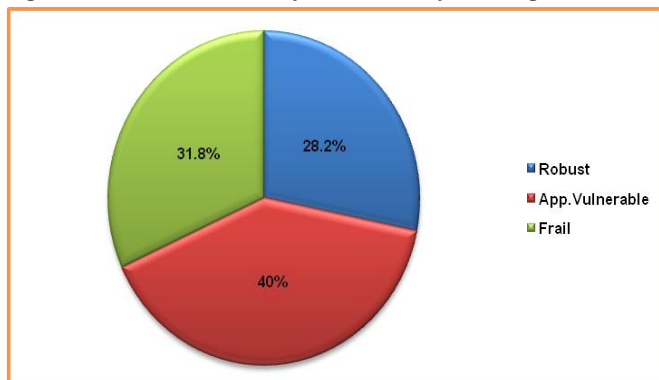
**4. Results**

Two hundred sixteen subjects of more than 60 years of age were examined. The mean age was 73.24 ± 8.3. There were 121 (56%) females and 95 (44%) males.

In this study, 28.2% of older adults had a Robust (non frail) score on the EFS (0–4), 40% had Apparently vulnerable scores on EFS (5–6), and 31.8% had different levels of frailty (including mild, moderate and severe frailty) on the EFS (7-17) shown in Figure 1.

Table 1 shows baseline distribution of subjects according to frail and non frail category and its association with gender, age group, education level and number of comorbidities. Age, gender and comorbidities were significantly associated with frailty (p<0.05). Level of education was not associated with frailty. Proportion of subjects in each category/component of Edmonton Frail Scale (EFS) is shown in Table 2.

**Figure 1: Prevalence of frailty in community dwelling older adults**



**Table 1: Characteristics of subjects and its association with Frailty**

Characteristics	Frail (69) n(%)	Non frail(61) n(%)	p value
<b>GENDER</b>			
Females	40(58)	25(41)	<0.05
Males	29(42)	36(59)	
<b>AGE GROUP</b>			
60-69	20(29)	33(54)	<0.01
70-79	23(33.3)	23(37.3)	
>80	26(37.7)	05(8.3)	
<b>LEVEL OF EDUCATION</b>			
<10 years	45(65.2)	43(70.5)	0.53
>10 years	24(34.7)	18(29.5)	
<b>COMORBIDITIES</b>			
0	10(14.49)	20(32.7)	<0.05
1	36(52.17)	27(44.2)	
2	23(33.34)	14(22)	

### 5. Discussion

This study states the prevalence of 31.8% of different levels of frailty among community dwelling older adults. A similar study on frailty in India (Yashikar, 2016) revealed prevalence of 26% of frailty.<sup>(12)</sup> As there are various different methods for evaluation of frailty, the prevalence of frailty can vary in the same population of older adults, depending on the instrument used.

The percentage of frailty in this study is higher in females and also associated with increasing age. This result is consistent with many other studies.<sup>(6,8,13,14)</sup> This is because women have lower average amounts of lean body mass and muscle strength. And relationship between frailty and sarcopenia is well established. One such study of frailty pattern among rural women of India (Sayani Das, 2018)<sup>(15)</sup> reported prevalence of 31.1% of frailty rural women in India.

Comorbidities are strongly associated with frailty which can also be observed in present study results (p<0.05). Presence of frailty in older people with chronic diseases is a predictor of mortality and hospitalization.<sup>(16, 17)</sup>

The clock drawing test has been recognized as a simple and useful tool for functional screening and has been used for early dementia detection. The results of study also mentions that 52% of participants have errors on the clock drawing test thus, the need of detailed assessment for cognition and its impact on functional capacity is required in this age.

In terms of memory, in present study 34% of older people at times forgot to take their prescribed medications. This is important to understand and consider as there is strong correlation between cognition and frailty. Cognitive impairment

in older adults results in decreased physical functioning and affects QOL.<sup>(18, 19, 20)</sup>

Mobility is an important requisite for functional independence. This study reveals 42% of older adults took more than 11 seconds to complete timed up and go test which shows impaired balance and greater risks for falls. A study (Jack Roberto Silva Fhon, 2013) showed that there was a greater chance of falling among the frail elders as compared to non frail.<sup>(21)</sup>

Other factors that increases the risk of frailty are social support, general health status, polypharmacy and weight loss (nutrition). In results, 58% of subjects reported their general health as 'fair' and 38% took more than 5 medicines per day (polypharmacy).

As frailty is potentially reversible, there is a strong need to identify frail older adults in community. Also, the percentage of subjects having apparently vulnerable score on EFS is 40%, which may convert into frail in future if not screened for frailty. Thus, identification of frailty among older adults is important to prevent the transition from pre frail to frail and plan an effective plan of care for frail subjects with multidisciplinary approach.<sup>(22)</sup>

### 6. Conclusion

India is a country with large number of older adults and frailty is common health syndrome in this age with adverse health consequences that can lead to disability and dependence. Early identification of older adults for frail or apparently vulnerable should be done which will provide an opportunity to suggest appropriate preventive and rehabilitative actions.

**Table 2: Proportion of Subjects in components/category of Edmonton Frail Scale (EFS)**

Sr. No.	Category	Possible Answers (Score)	Answers	
			n=216	%
1	<b>Cognition</b> Clock Drawing Test	Approved (0)	59	27
		Failed - minimum errors	45	21
		Failed - significant errors	112	52
2	<b>General health status</b> In the past year, how many times have you been hospitalized?	Zero (0)	148	68
		1-2 (1)	54	25
		>2(2)	14	7
3	In general, how would you describe your health?	Excellent, very good or good (0)	36	17
		Fair (1)	126	58
		Poor (2)	54	25
4	<b>Functional independence</b> With how many of the following activities do you require help?	0-1 (0)	180	83
		2-4 (1)	36	17
		5-8 (2)	-	-
5	<b>Social support</b> When you need help, can you count on someone who is willing and able to meet your needs?	Always (0)	18	8
		Sometimes (1)	90	42
		Never (2)	108	50

6	<b>Medication use</b> Do you use five or more different prescription medications on a regular basis?	No (0)	135	62
		Yes (1)	81	38
7	At times, do you forget to take your prescription medications?	No (0)	144	66
		Yes (1)	72	34
8	<b>Nutrition</b> Have you recently lost weight such that your clothing has become looser?	No (0)	157	72
		Yes (1)	59	28
9	<b>Mood</b> Do you often feel sad or depressed?	No (0)	112	52
		Yes (1)	104	48
10	<b>Continence</b> Do you have a problem with losing control of your urine when you do not want to?	No (0)	144	66
		Yes (1)	72	34
11	<b>Functional performance</b> Timed up and Go Test	0-10 seconds (0)	126	58
		11-20 seconds (1)	90	42
		>20 seconds (2)	-	-

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