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Research Article

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Cross Sectional Study to Assess Proportion of Frailty and its Association with Sociodemographic Factors, Depression, Activities of Daily Life and Instrumental Activities of Daily Life among Community Dwelling Elderly Inan Urban Slum-A Study Done in Dharavi, Mumbai

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ABSTRACT

Introduction: Report of the Technical Group on Population Projections for India and States 2011-2036, says an increase of nearly 34 million elderly persons was seen in 2021 over the Population Census 2011 and is expected to increase by around 56 million elderly persons in 2031.Frailty is a multidimensional geriatric syndrome that increases the risk for adverse health outcomes, such as falls, hospitalization, increased morbidity and mortality. The aim of present study was to find out the proportion offrailty and its association with socio-demographic factors, depression, activities of daily life and instrumental activities of daily life among community dwelling elderly in the field practice area of urban health training centre in urban slum. **Methods**: Community based cross sectional study among 147 elderly persons selected by multistage sampling from 8 health posts under the urban health training centre was done. A pretested semi structured guided questionnaire with respective scales were used to collect data. **Results**: Proportion of frailty was 28.6%.Age, illiteracy, people without job, loss of spouse, economic dependency were significantly associated with frailty. Frailty was also associated with unsatisfactory Activities of Daily Life score (p – 0.009), unsatisfactory Instrumental Activites of Daily Life score (p <0.001) and high Geriatric Depression Score(p<0.001). **Conclusion**: Frailty should be recognised as a public health priority and by taking appropriate measures to identify frail elderly, we can help our population to have a healthy ageing.

Key Words: *Elderly, Fraility, Depression, ADL, IADL.*

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INTRODUCTION & BACKGROUND

Population ageing is a global phenomenon. With the passage of time, every country in the world is experiencing growth in the size and proportion of older persons in their population. Population ageing is an inevitable demographic reality that is associated with improvements in health and medical care system. With longevity and declining fertility rates, the population of older persons (60 years and above) is growing faster than the general population globally. This phenomenon is known as population ageing. When population age increases rapidly, this has implications on the socioeconomic and health status of the elderly. Though ageing is the natural stage of human life, it brings with it innumerable problems for the people who have grown old[1].

Frailty is one such condition which is theoretically defined as a clinically recognizable state of increased vulnerability resulting from aging-associated decline in reserve and function across multiple physiologic systems such that the ability to cope with everyday or acute stressors is compromised[2]. It increases the risk of disability, dependency, institutionalization, falls, injuries, acute illness, hospitalizations, slow or incomplete recovery from illness and/or hospitalization, and mortality[3]. Reduced physiologic capacity in neurologic control, mechanical performance, and energy metabolism are the major components of frailty[4]. Frailty is not synonymous with either comorbidity or disability, but comorbidity is an etiologic risk factor for, and disability is an outcome of frailty[4].

Situation in India

The population of elderly in India had been increasing steadily since 1961. The growth in the elderly population became faster mainly due to decrease in the death rate because of various health interventions after the census 1981. The addition of the elderly population during 2001- 2011 was more than 27 million. As per the Report of the Technical Group on Population Projections for India and States 2011-2036, an increase of nearly 34 million elderly persons was seen in 2021 over the Population Census 2011 and is further expected to increase by around 56 million elderly persons in 2031[1]. With increase in life expectancy , people also have right to a long life in good health, rather than one of pain and disability[5]. Disability being an outcome of frailty, identifying frail people and taking corrective measures will help to prevent disability or other adverse health outcomes.

A systematic review on 2017 found scarcity of studies on frailty in developing countries despite the evidence that populations are rapidly ageing in these countries and recommended widespread research in this context [6]. In India also very few studies are available on frailty which is necessary for health and social care planning of the elderly. 10 percent of population residing in the field practice area of our urban health training centre are elderly which is higher than the national average of 8.1percent. And frail elderly are at more risk of falls, fractures which can make them bed ridden, home bound, increasing depression and chances of non-communicable diseases. With increase in life expectancy, these elderly also have a right to a long life in good health, rather than one of pain and disability. Sensing a priority area the present study aimed at assessing the proportion of frailty and its association with sociodemographic variables, depression, activities of daily life and instrumental activities of daily life among elderly.

AIM AND OBJECTIVES

Aim:

To assess the proportion of frailty and its association with sociodemographic variables, depression and daily activities among community dwelling elderly in the field practice area of urban health training centre in an urban slum.

Primary Objectives :

1. To estimate the proportion of frailty among community dwelling elderly in the field practice area of an urban health training centre attached to a teaching medical institute.
2. To assess the relationship of sociodemographic factors with frailty.
3. To observe the association of frailty with depression.
4. To observe the association of frailty with activities of daily living and instrumental activities of daily living.

Materials & Methods of Study

This community based cross sectional study was done in the field practice area in Dharavi, Mumbai of the urban health training centre of Lokmanya Tilak Municipal Medical College, Mumbai. Institutional Ethics committee approval was obtained prior to the study. Total 147 study subjects above and equal to 60 years of age were included in the present study. It was calculated based on a previous study where proportion of frailty was 38.8%and after considering design effect[7]. Multistage sampling with simple random sampling and systematic random sampling were used to select the study subjects.

Selection of study subjects:

Field practice area under the urban health training centre in Dharavi is divided into 8 sections based on an existing micro-plan in the area for field work by ASHAs.Out of the 8 sections , 2 were selected randomly. From these 2 sections, 2 areas from each section were selected randomly based on the microplan. Total sample was divided between four areas based on the proportion of houses.

Table 1: Selection of study subjects

	No of Houses	Proportion (percent)	No of houses from each area
Area 1	1210	28	43
Area 2	1080	25	38
Area 3	915	21	33
Area 4	1131	26	40

28^{th} house in each of the study areas were selected by circular systematic random sampling [8]. In case an elderly satisfying the inclusion and exclusion criteria was not available in the selected house, the succeeding house with elderly satisfying the criteria was selected. In presence of more than one elderly in one house , one was selected by lot method.

Inclusion criteria

a. Elderly above or equal to 60yrs who was a resident of the study area.
b. All those who were willing to give informed consent.

Exclusion criteria

Those who were unable to comprehend the question, mentally ill, unable to hear, and did not give consent.

Study tools used were

Pre tested Semistructured Guided Questionnaire
Tilburg Frailty Indicator
Geriatric depression scale
Activities of Daily Life Questionnaire
Instrumental Activites of Daily Life Questionnaire.

Operational definitions

1. Elderly = Age >/= 60 yrs, all those who had completed 60yrs on the day of study which was confirmed by an official document .
2. Tilburg Frailty Indicator (TFI) is a self-report user-friendly validated questionnaire for assessing multidimensional frailty among community-dwelling older people. It has 3 components-physical, psychological and social , eight questions regarding physical component, four questions on psychological component, and three questions on social component are present[7].
   Total attainable score is ranged from 0 to 15. Scoring is done as ≥6 (Frail).
3. Geriatric depression scale, short form (GDS), contains 15 questions regarding geriatric depression. Attainable score ranges from 0 to 15 and an individual with a score of ≥6 is considered to be depressed[9].
4. The Katz Index of Independence in Activities of Daily Living (ADL), commonly referred to as the Katz ADL, is the most appropriate instrument to assess functional status as a measurement of the client's ability to perform activities of daily living independently. The Index ranks adequacy of performance in the six functions of bathing, dressing, toileting, transferring, continence, and feeding. Clients are scored yes/no for independence in each of the six functions[10].
   Scoring is done as </= 2 – unsatisfactory ADL
5. The Lawton Instrumental Activities of Daily Living(IADL) is an easy to administer assessment instrument that provides self-reported information about functional skills necessary to live in the community. These skills are considered more complex than the basic activities of daily living as measured by the Katz Index of ADLs. There are eight domains of function measured with the Lawton IADL scale[11].
   Scoring will be done as </= 2 – unsatisfactory IADL
6. Modified B.G. Prasad scale (revised 2021) was used for determining Socioeconomic status[12].
7. Based on education, sample was classified into 5 groups as illiterate, below primary, primary, middle school, secondary and above[7].
8. International Standard Classification of Occupations (ISCO) was used for classifying occupation[13].

Data analysis

Microsoft excel was used for data entry and SPSS version 16 was used for data analysis .

Results

147 elderly were included in the current study. Among the study subjects, majority were females, 91(61.9%), majority were hindu (47.6%) or muslim (45.6%) by religion. Majority of study subjects were illiterate 73(49.7%), and were currently unemployed111(75.5%). 66(44.9%) were widow or widower and 85(57.8%) were economically fully dependent.Majority of them, 60(40.8%) belonged to class 4 according to BG Prasad classification.

Table 2 shows distribution of study subjects based on the scores obtained using Tilburg Frailty Indicator (TFI), Geriatric depression scale (short form),Katz Index of Independence in Activities of Daily Living and Lawton Instrumental Activities of Daily Living. 42(28.6%) were found to be frail. 37 (25.2%) were depressed, 5 (3.4%) had unsatisfactory ADL score, and 35 (23.8%) had unsatisfactory IADL score. Among the sociodemographic factors assessed frailty was found to be significantly associated with increasing age, illiteracy, absence of any job (current and past), loss of spouse, and economic dependency (Table 3).

Fraility was significantly associated with unsatisfactory Activities of Daily Life score (p – 0.009), unsatisfactory Instrumental Activites of Daily Life score (p <0.001) and high Geriatric Depression Score (p<0.001) (table 4).

Table 2: TFI, GDS, ADL, IADL scores

Scores		**Frequency (%)**
Tilburg Fraility Status	Normal	105 (71.4%)
	Frail	42 (28.6%)
Geriatric Depression Score	Normal	110 (74.8%)
	Depressed	37 (25.2%)

ADL Score	Satisfactory	142 (96.6%)
	Unsatisfactory	5 (3.4%)
IADL Score	Satisfactory	112 (76.2%)
	Unsatisfactory	35 (23.8%)

Table 3: Factors associated with frailty

Characteristics		**Frailty Status**		**p-value**
		Normal	**Frail**	
Gender	**Male**	41 (39%)	14 (34.1%)	0.704
	Female	64 (61%)	27 (65.9%)	
Age (in years)	**60- 64**	39 (37.1%)	9 (21.4%)	**0.002**
	65-69	27 (25.7%)	5 (11.9%)	
	70-74	30 (28.6%)	14 (33.3%)	
	75-79	5 (4.8%)	7 (16.7%)	
	≥80	4 (3.8%)	7 (16.7%)	
Religion	**Hindu**	56 (53.3%)	14 (33.3%)	0.072
	Muslim	42 (40%)	25 (59.5%)	
	Christian	3 (2.9%)	0	
	Buddhism	4 (3.8%)	3 (7.1%)	
Education	**Illiterate**	43 (41%)	30 (71.4%)	**0.007**
	Below primary	18 (17.1%)	7 (16.7%)	
	Primary	24 (22.9%)	3 (7.1%)	
	Middle School	14 (13.3%)	2 (4.8%)	
	Secondary and above	6 (5.7%)	0	
Occupation- Current	**Unemployed**	73 (69.5%)	38 (90.5%)	**0.043**
	Elementary occupations	24 (22.9%)	3 (7.1%)	
	Semiskilled and skilled	7 (6.7%)	1 (2.4%)	
	Professional	1 (1%)	0	
Occupation- Past	**Unemployed**	30 (28.6%)	22 (52.4%)	**0.048**
	Elementary occupations	48 (45.8%)	15 (35.7%)	
	Semiskilled and skilled	26 (24.8%)	5 (11.9%)	
	Professional	1 (1%)	0	
Marital Status	**Married**	65 (61.9%)	13 (31%)	**<0.001**
	Unmarried	2 (1.9%)	0	
	Divorced	0	1 (2.4%)	
	Widow/widower	38 (36.2%)	28 (66.7%)	
Economic dependency	**Fully dependent**	50 (47.6%)	35 (83.3%)	**<0.001**
	Partially dependent	31 (29.5%)	1 (2.4%)	
	Not dependent	24 (22.9%)	6 (14.3%)	
BG Prasad class	**2**	3 (2.9%)	0	0.782
	3	30 (28.6%)	10 (23.8%)	
	4	42 (40%)	18 (42.9%)	
	5	30 (28.6%)	14 (33.3%)	

Table 4: Relationship of ADL, IADL, and depression with frailty

Frailty	**Mean ADL**	**Mean IADL**
Present	1.01±0.098	1.08±0.267
Absent	1.1±0.297	1.64±0.485
p-value	**0.009**	**<0.001**

Frailty	**Geriatric Depression Score**	
	1	**2**
Present	21 (19.1%)	21 (56.8%)
Absent	89 (80.9%)	16 (43.2%)
p-value	**<0.001**	

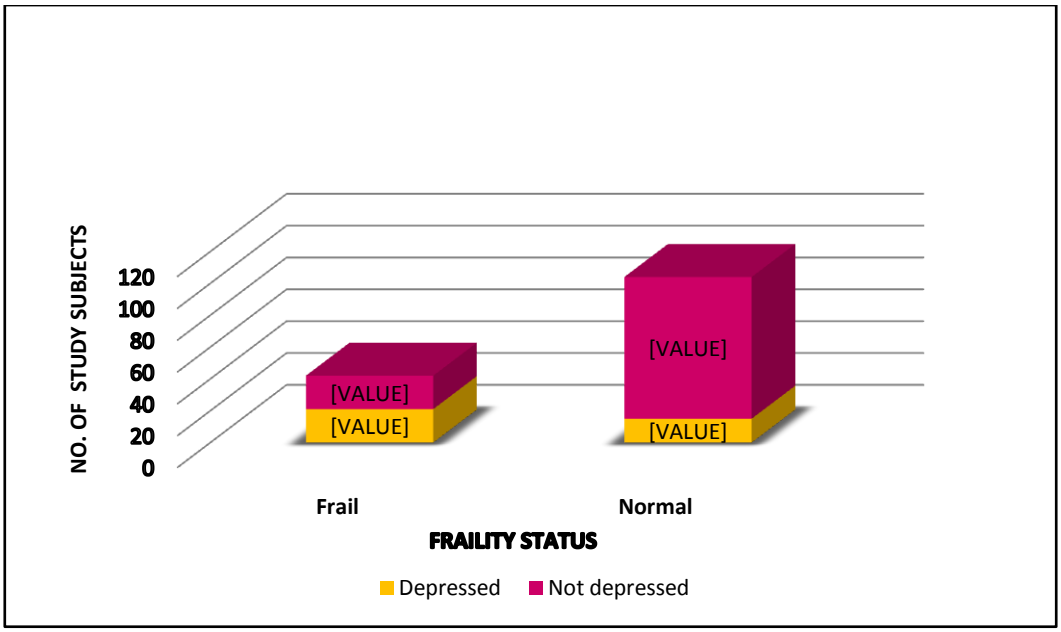

Figure 1: Graph showing proportion of frail and normal individuals with Depression.

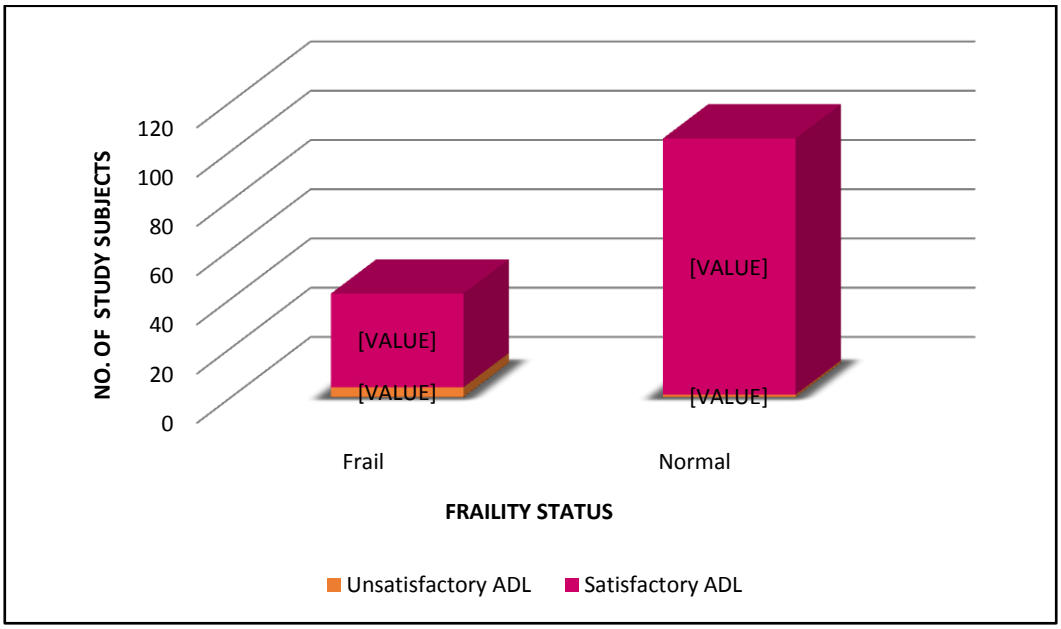

Figure 2 : Graph showing proportion of frail and normal individuals with unsatisfactory Activites of Daily Life score.

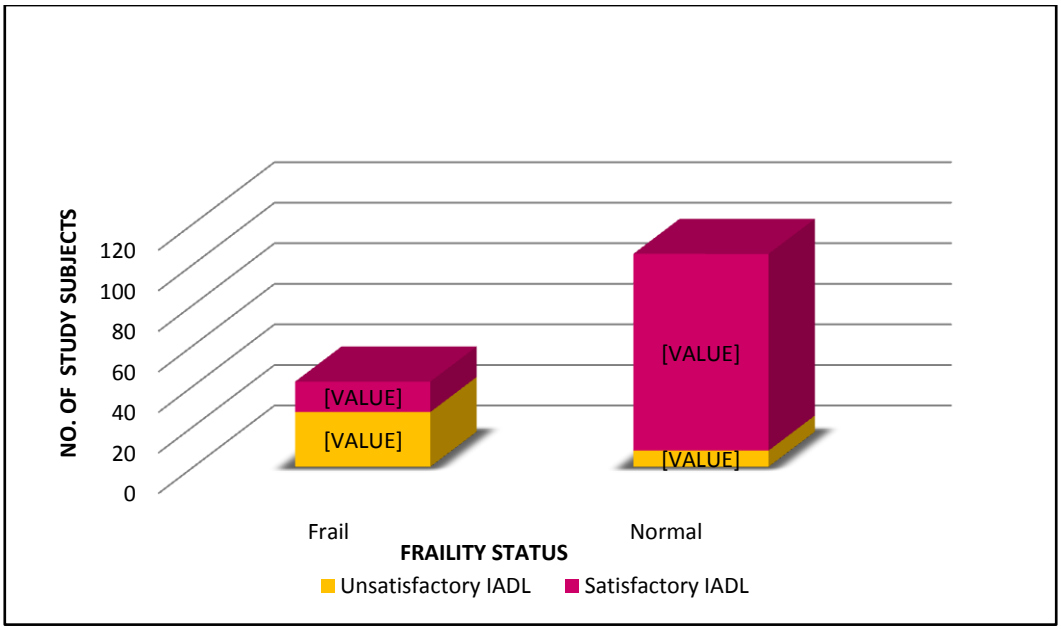

Figure 3 : Graph showing proportion of frail and normal individuals with unsatisfactory Instrumental Activites of Daily Life score.

DISCUSSION

This study was done in the urban slum in Dharavi which came under the field practice area of our institute. Slums differ from other habitations in terms of overcrowding, poor ventilation, poor lighting and poor sanitation. All these has an ill effect in quality of life of slum dwellers. As already mentioned proportion of elderly population in this area was 10percent which was higher than the national average.We have a good health care system catering this area, which can be utilised. However lack of availability of data is the major hurdle to initiate any intervention. Hence the present study was planned and conducted.

Proportion of fraility in present study was found to be 28.6%.In present study increasing age, illiteracy, unemployment, loss of spouse, and economic dependency was found to be significantly associated with fraility. Gender was not found to have any significant association. Depression, unsatisfactory ADL and IADL scores were significantly associated with fraility.

Proportion of fraility was 26.6% in the study done by Kashikar*et al*. among community dwelling elderly in Pune which was almost same as the present study. Kashikar *et al*. had also done the study in an urban area. In Kashikar*et al*. study lower education, economic dependency, not going out, fear of falling and loss of emotional support was found to be significantly associated with fraility. Kashikar *et al*. study also found significant association between depression and fraility, which was similar to present study[14]

A similar study was done by Dasgupta*et al*. in rural area in Kolkata. Proportion of fraility was higher in the study (38.8%). Age, female sex, widows or widowers, low educational status, no occupation, and little or no money for expenditures were factors that were significantly associated with frailty.This study had found significant association betweenfraility and unsatisfactory ADL and IADL scores. These findings were comparable with present study. However contradictory to the findings in the present study depression was not found to be significantly associated with fraility[7].

In 2017, Ding et al. carried out a retrospective longitudinal research in London. The study's sample size was 4386 people. Association of age and depression in this study was comparable to the results in the present study[15].

Limitations: Fraility in association with cognitive impairment is not assessed as this is a self reported questionnaire.

CONCLUSION

Fraility is a state which makes an elderly vulnerable to diseases, disability, dependence, and increased hospitalizations. The timely detection of frailty among elderly will help to initiate preventive, supportive, and self-care measures among frail persons and ultimately this will reduce the burden of fall, hospitalizations, and disability through timely handling the external stressors.Simple tools like Tilburg Fraility Indicator are available which can be used for screening the elderly at primary care setting.

From all the above findings it is clear that frailty, depression and quality of life, all are interrelated. Measures to improve each one in turn has a positive effect in the other factors. With early detection of frail elderly at primary level care, affordable measures like regular physical activities (to improve muscle strength), appropriate medications for diseases, self-support and self-care practices(like using stick in roads, a hand rail in bathroom, etc.) can be initiated. This can help the elderly from adverse health outcomes and also help them to lead a healthy life. Formation of social groups for elderly, conducting recreational activities, empowering the elderly through schemes like New India Literacy Programme, old age pension schemes to make them self sufficient are some other actions we can take up to improve the life of elderly.

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