Screening of Hospitalized Elderly Patients for Frailty and Associated Co-morbid Conditions in Western Gujarat in India

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ABSTRACT

Background: Older patients admitted to hospitals have a greater impact on the healthcare system as the population ages. The relationship between the recovery of functional impairments and frailty status in geriatric care units is still not clear. Simple screening technologies are required in order to operationalize frailty management in this susceptible population due to these restrictions. **Aim:** The study aims to screen hospitalized older adults for frailty and associated co-morbid conditions in western Gujarat, India. **Materials and Methods:** This is an institutionally based cross-sectional study conducted on the elderly patients (aged 60 years or more) admitted at the tertiary-level government hospital of Jamnagar District of Gujarat State during the period of October 22 to December 22. The assessment was done with a structured questionnaire for FRAIL screen, the Rapid Cognitive Screen (RCS), Charles Co-morbidity Index, Geriatric Depression Scale-5 (GDS-5), and Short Form-12 (SF-12) Health Survey. **Results:** The overall findings of this study reveal that of 124 participants 34 (27%) were frail, 52 (42%) were found to be a likelihood of depression by the GDS, and 29 (23%) were having dementia by RCS, respectively. In our study, we also found a statistically significant association between frailty and dementia (*P* value < 0.001). **Conclusion:** The present study implies the prevalence of frailty among old age elderly patients and its association with various socio-demographic and co-morbid conditions of the participants. Early identification of frailty and co-morbid conditions can help to prevent adverse health outcomes.

Keywords: Dementia, depression, elderly patients, frail screening

Introduction

Elderly patients admitted to hospitals have a greater impact on the healthcare system as the population ages. To facilitate informed discussions and tailored programs to support this vulnerable population, it is crucial to understand who is at risk for negative outcomes in the aging population.

There are currently few screening methods available for the geriatric population that can forecast unfavourable postoperative outcomes. The American Society of Anaesthesiology (ASA) level and a cardiac assessment like a Revised Cardiac Risk Index[1,2] or Gupta Index are commonly used to estimate the preoperative risk;[3] however, because they are unable to adequately account for the complexity of the aged population, these screening tools are limited for the older adult population. To put it another way, they don't evaluate for frailty. The existence of frailty in older patients is increasingly acknowledged as a factor in the treatment's success.[4-8]

The frailty phenotype includes five characteristics fatigue, weakness, poor endurance, physical illness, and weight loss.[9]

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The Fried criterion and the Rockwood frailty index are the two most widely used definitions of frailty.[10,11] Using these diagnostic methods, frailty screening has the drawback of being time- and labour-intensive. The recently developed FRAIL scale is a five-point self-reported instrument that is easy to administer and has been validated in the community population.[12]

The relationship between the recovery of functional impairments and frailty status in geriatric care units is still not clear. One retrospective observational study in an acute geriatric ward revealed that an increasing frailty status may be related to a lower functional recovery.[13,14] Furthermore, early identification of appropriate hospitalized patients based on their frailty condition is crucial to maximizing the effective utilization of the facilities since admission to hospital wards is often short term and their availability is constrained.

Screening for frailty can help identify elderly patients who are at risk of developing adverse health outcomes, such as falls, delirium, and mortality. Early identification of frailty can help primary physicians and family medicine doctors develop appropriate care plans to prevent or manage these outcomes.

Given that there is currently a lack of consensus regarding the appropriate assessment of frailty in older adults admitted to the hospital, and the study aims to screen hospitalized older adults for frailty and associated co-morbid conditions in western Gujarat in India.

Materials and Methods

The present cross-sectional study was conducted among elderly patients (aged 60 years or more) admitted at the tertiary-level government hospital of Jamnagar District of Gujarat State during the period of October 22 to December 22. As the study centre is lacking dedicated geriatric ward, patients were identified from the major different wards (medicine, surgery, gynaecology, orthopaedic, etc.) of the hospital. A total of 124 elderly patients were selected by purposive sampling method from different wards, and data were collected in the first 24–48 hours of admission.

Data collected were entered in the Microsoft Excel software, and all analyses were performed using IBM SPSS statistics for Windows version 26; suitable statistical tests were applied. All statistical tests were two-sided, and $P < 0.05$ was used to indicate statistical significance.

The study was approved by the Institutional Ethical Committee of the host institute, and verbal informed consent was taken from the participants before enrolling them in the study.

The FRAIL screen is a brief, validated tool used to assess frailty in older adults. It consists of five simple questions related to fatigue, resistance, aerobic capacity, illnesses, and loss of weight.[15,16] Each question is answered with a simple "yes" or "no" response. For each "yes" answer, the individual is given one

point, and all patients were categorized using the FRAIL scale into three groups: robust (score = 0), prefrail (score = 1–2), and frail (score = 3–5).[17-20]

The Rapid Cognitive Screen (RCS) is a brief cognitive assessment tool that is used to quickly screen for cognitive impairment in older adults. It consists of six tasks that assess different cognitive domains, including attention, memory, executive function, and language. The RCS takes approximately five minutes to administer and has been found to have good sensitivity and specificity for detecting cognitive impairment.[21]

Each task is scored based on a specific set of criteria, and the scores are added together to provide an overall score. A lower score on the RCS indicates greater cognitive impairment, Like 0–5 were the likelihood of dementia, 6–9 were mild cognitive impairment, and >10 was normal, with no impairment.

The Charlson Co-morbidity Index is a scoring system used to predict the risk of mortality for patients with multiple medical conditions. The index assigns a score to each of the 19 medical conditions, with higher scores indicating a greater risk of mortality. Each condition is assigned a score between 1 and 6 based on its association with mortality. The scores are then added together to provide a total score, which ranges from 0 to 37. Higher scores indicate a greater risk of mortality.[22]

The Geriatric Depression Scale-5 (GDS-5) is a screening tool used to assess depression in older adults. It consists of five yes/no questions and is a shortened version of the longer Geriatric Depression Scale (GDS).[23]

Each affirmative answer is scored with one point, with a total possible score ranging from 0 to 5. A score of 2 or greater suggests a likelihood of depression and should be followed up with a further assessment

The Short Form-12 (SF-12) Health Survey is a 12-item questionnaire used to assess g health outcomes from the patient's perspective. Participants recorded a score of 50 or less on the **Physical Component Summary (**PCS-12) indicating they had a physical condition while participants scored less than 42 on the **Mental Component Summary** (MCS-12) indicating they have clinical depression.[24]

Results

A total of 124 hospitalized elderly patients were included in the present study, ages ranged from 60 to 93 years with a mean age of 72 ± 9.2, there were 64 males (52%) and 60 females (48%), 115 were married (93%) and 99 were living with a spouse (80%), majority of them 109 (88%) were belong to lower socio-economic class [Table 1].

Out of 124 patients, 27% were found to be frail and 60% were prefrail and 42% of participants were found to be having a

likelihood of depression according to the GDS-5. According to the Charlson Co-morbidity Index, 18% and 52% were found to be moderate, and mild co-morbid conditions, respectively. According to RCS assessment tool out of all participants 23% had dementia and 50% had mild cognitive impairment. In SF-12 questionnaires, out of all participants 94.3% got less than 50 score in the physical score and while 37% were having less than 42 score in the mental score [Table 2].

In our study, we didn't find any statistically significant association between frailty and socio-demographic characteristics. In our study, we found that out of 91 participants with dementia, 92% were found to be frail, and this is also statistically significant (*P* < 0.0001) [Table 3].

In our study, we found that among participants who live without spouse, the majority of them (80%) have dementia as compared to those who live with spouse (48%), and this difference is also statistically significant (*P* = 0.005) [Table 4].

In our study, we found that depression is more among participants who live without spouse (45%) as compared to those who live with spouse (28%); this difference is also statistically significant (*P* = 0.041); depression is found also more among illiterate (52%) as compared to literate (28%); this difference is also statistically significant (*P* = 0.008) [Table 5].

Discussion

The present cross-sectional study was conducted among 124 elderly patients (aged 60 years or more) admitted at the tertiary-level government hospital of Jamnagar District of Gujarat with a mean age of 72 ± 9.2, as in a similar study conducted as a prospective observational study, patients from the acute geriatric ward of Hualien Tzu Chi Hospital, Taiwan 114 participants were included and their mean age, 79.8 ± 8.1.[25]

While assessment of frailty and other co-morbid conditions among participants, 27% of participants were found to be frail and 60% were prefrail, as we got a higher result from a previous study in Taiwan which found 23% of frail and 50% prefrail,[25] but it is lesser when compared to a Brazil study where 58.3% were classified as frail according to the frailty scale.[26]

In our study, we found 42% of participants were found to be having a likelihood of depression according to the GDS-5 which was higher compared to the previous studies. A study of 281 community-dwelling older adults found that 19% had a likelihood of depression based on the GDS-5.[27]

In our study, according to the Charlson Co-morbidity Index, 18% and 52% were found to be moderate, and mild co-morbid conditions, respectively, Which was compared to previous study where among 5621 patients, the high CCIS (≥ 3) group showed higher proportion of elderly population and lower plasma hemoglobin and lower lymphocyte and platelet counts.

Table 1: Socio-demographic profile of the participants

	Number	Percentage
Gender		
Male	64	52
Female	60	48
Age		
60-70 years	99	80
70-80 years	22	18
>80 years	3	2
Marital status		
Married	115	92.7
Unmarried	4	3.3
Divorcee	5	4
Living status		
Without spouse	99	80
With spouse	25	20
Education		
Illiterate	71	57
Literate	53	43
Occupation		
Retried	2	1.6
Business	12	9.6
Housewife	31	25
Labour	51	41
Socio-economic status (modified BG Prasad Classification)		
Class 1	5	4
Class 2	10	8
Class 3	31	25
Class 4	40	32
Class 5	38	30

Table 2: Assessment of frailty and other co-morbid conditions among participants

	Number	Percentage
FRAIL screen		
Robust	15	12
Prefrail	75	60
Frail	34	27
Geriatric Depression Scale-5 (GDS-5)		
Depression	52	42
Charles Co-morbidity Index		
None	36	29
Mild	64	52
Moderate	23	18
Severe	1	1
Rapid Cognitive Screener		
Normal	33	27
Mild	62	50
Dementia	29	23
Short Form-12 (SF-12)		
PCS-12	117	94.3
MCS-12	46	37

The high CCIS group was an independent risk factor for composite outcome (HR 3.63, 95% CI 2.45–5.37, *P*<.001) and patient mortality (HR 22.96, 95% CI 7.20–73.24, *P*<.001) (DH Kim *et al*).[28]

Table 3: Association of frailty with various socio-demographic characteristics and other co-morbid conditions

	Frail No.(%)	Normal No.(%)	P	ODDS Ratio	95% CI
Age					
60-70	88 (88)	11 (22)	0.494	0.681	0.131`-9.89
70-80	19 (86)	3 (14)			
>80	2 (66)	1 (44)			
Gender					
Female	55 (92)	5 (8)	0.683	0.815	0.271-2.355
Male	54 (84)	10 (16)			
Socio-economic Status					
Lower	96 (88)	13 (12)	0.876	0.921	0.178-4.348
Upper	13 (86)	2 (14)			
Marital status					
Married	105 (91)	10 (9)	0.58	0.651	0.195-17.989
Unmarried	4 (100)	0			
Living status					
With spouse	20 (80)	5 (20)	0.175	0.765	0.685-7.226
Without spouse	89 (89)	10 (11)			
Literacy					
Illiterate	64 (90)	7 (10)	0.819	0.564	0.293-2.643
Literate	45 (84)	8 (16)			
Dementia					
Presence	84 (92)	7 (8)	0.013*	3.84	1.2668-11.632
Normal	7 (21)	26 (79)			

Table 4: Association between dementia by Rapid Cognitive Screener with socio-demographic characteristics

Variables	Dementia No.(%)	Normal No.(%)	P	ODDS Ratio	95% CI
Living status					
With spouse	12 (48%)	13 (52%)	0.005	4.279	1.696-10.796
Without spouse	79 (80%)	20 (20%)			
Educational status					
Illiterate	56 (79)	15 (21)	0.85	0.245	0.234-1.245
Literate	35 (66)	13 (33)			
Gender					
Male	46 (77)	14 (23)	0.651	0.123	0.456-2.546
Female	45 (70)	19 (30)			

Table 5: Association between depression by Geriatric Depression Scale-5 (GDS-5) with socio-demographic characteristics

Variables	Dementia No.(%)	Normal No.(%)	P	ODDS Ratio	95% CI
Living status					
With spouse	7 (28)	18 (72)	0.041	0.38	0.162-0.976
Without spouse	45 (45)	54 (55)			
Educational status					
Illiterate	37 (52)	34 (48)	0.008	2.75	1.292-5.881
Literate	15 (28)	38 (72)			

According to RCS assessment tool out of all participants 23% had dementia and 50% had mild cognitive impairment which was lower when compared with the previous study conducted By O'Caoimh *et al.*, it shows in overall 366 participants were recruited; 53 with subjective memory complaints (SMC), 74 with MCI, 193 with dementia, and 46 normal controls.[29] In SF-12 questionnaires, out of all participants 94.3% got less than 50 score in the physical score and while 37% were having less than 42 score in the mental score which was also higher when compared with the previous studies conducted by arovah *et al.* found that the mean physical SF 12 score was 44.40and the mean mental SF 12 score was 68.01, indicating the poor physical and mental health related quality of life.[30]

In our study, out of 91 participants with dementia 92% were found to be Frail, and this is also statistically significant ($P < 0.0001$) with an OR of 3.84, so that means people with dementia have 3.8 times higher odds of having frailty compared to those without dementia which was a similar finding of a systematic review and meta-analysis of 16 studies including 12,070 participants found that the odds of frailty among older adults with dementia were significantly higher compared to those without dementia (OR = 3.18, 95% CI 2.53-3.99).[31]

In our study, we found that among participants who live without spouse, majority of them (80%) having dementia as compared to those who live with spouse (48%) and this difference is also statistically significant ($P = 0.005$). The finding that living without a spouse is associated with higher odds of dementia, as previous research done by Holt Lunstad J *et al.* has also found that social isolation and lack of social support are risk factors for cognitive decline and dementia.[32]

Findings of our study shows that depression is more among participants who live without spouse (45%) as compared to those who live with spouse (28%), and this difference is also

statistically significant ($P = 0.041$) and depression is found also more among illiterate (52%) as compared to literate (28%) and this difference is also statistically significant ($P = 0.008$) and these findings are consist with Indian study found that a lower educational level was significantly associated with a higher risk of depression among elderly.[33]

Screening for frailty and associated co-morbid conditions can help primary physicians and family medicine doctors develop tailored care plans for their elderly patients. For example, patients who are identified as frail may benefit from interventions such as physical therapy, nutritional support, and medication review to prevent adverse outcomes.

Conclusion

The present study revealed that frailty is prevalent among hospitalized elderly patients in western Gujarat, India, and is significantly associated with various co-morbid conditions. The study found that elder person with a higher number of co-morbid conditions was more likely to be frail. The prevalence of frailty and co-morbid conditions was higher among women and those with lower educational levels.

The study highlights the need for routine screening of frailty and co-morbid conditions in hospitalized elderly patients. Early identification of frailty and co-morbid conditions can help prevent adverse health outcomes and improve the quality of life of elder persons.

Future longitudinal studies should be designed to examine the causal relationships between frailty, co-morbid conditions, and other outcomes.

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Conflicts of interest

There are no conflicts of interest.

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