Frailty syndrome and quality of life in hospitalized older adults

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Abstract

Objective: to analyze the relationship between frailty syndrome and quality of life in hospitalized older adults. *Methods:* a quantitative cross-sectional study of 323 older individuals was carried out at university hospitals of Paraíba from August 2019 to July 2020. Data were analyzed by SPSS, version 26.0, using Pearson´s chi-square, Spearman´s correlation and multiple logistic regression for sociodemographic, frailty and quality of life variables. *Results:* regarding participant profile, 60.7% were women, 49.2% aged 60-69 years, 51% had a partner, 67.8% were literate, 89.2% lived with at least 1 other person, 78.3% were not working, and 57.9% received ≤ 1 minimum wage. Frailty syndrome was significantly associated with gender, age, literacy, work status, income, and quality of life. Quality of life was statistically significantly associated with only gender and work status. Results showed that illiteracy, not working and low quality of life increased the probability of frailty syndrome by 3.04 (95%CI; 1.70–5.4), 4.51 (95%CI; 2.39–8.49), and 3.81 (95%CI; 2.22–6.53), respectively; while not working increased the probability of low quality of life.by 2.61 (95%CI;1,45–4,73). *Conclusions:* frailty syndrome was associated with low quality of life in the hospitalized older adults, indicating the need for measures by hospital managers to improve care beyond the clinical conditions addressed in routine practice.

Keywords: Aged. Frailty. Quality of Life. Hospitals.

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INTRODUCTION

Cardiovascular diseases constitute one of the leading causes of hospitalizations, followed by cancers and diseases of the digestive tract. Falls are also a frequent cause of hospitalization in older individuals and are associated with functional decline and, thus, contribute to health problems[1]. During the aging process, older people develop vulnerabilities that can directly impact quality of life[2]. The physical and psychic changes which accompany this stage of life are not directly associated with the development of diseases. However, owing to both intrinsic and extrinsic factors, older people can exhibit signs of frailty and a vulnerable state of health susceptible to diseases, emotional stress and falls[3].

Frailty syndrome is defined as a cumulative state of homeostatic imbalance and reduction in muscle strength that predicts adverse health events in the older population[4]. The syndrome is characterized by multiple etiologies and complex outcomes and can lead to cognitive and functional decline, risk of falls, depression, violence and institutionalization or hospitalization[5].

Frailty can be measured based on several criteria which are related to the phenotype of older people, namely: reduced level of physical activity, self-reported fatigue, non-intentional weight loss, and reduced handgrip strength and gait speed[6]. Criteria for diagnosing frailty include signs such as slowed movements, exhaustion, involuntary weight loss, loss of muscle strength and sedentarism[7]. Early detection of these signs and symptoms favors timely prevention and rehabilitation measures, as well as improved quality of life of this group.

Frailty can manifest differently in each individual and requires different levels of care. Development of frailty is associated with a greater likelihood of falls and hospitalizations[8]. In a recent Brazilian study of 461 older individuals aged ≥66 years, 5.2% of participants were classified as frail (≥3 signs of frailty) and 49.9% as pre-frail (1-2 signs of the syndrome)[9].

Therefore, as a result of the physiological changes induced by aging, frail older adults require a greater level of assistance and care, rendering them more dependent[2]. Family members, unable to meet the care needs of the older individual, resort to hospital admission as an alternative[10]. Hospitalization, albeit necessary, can become a negative measure due to the need for the patient to adapt to the new routine and procedures, affecting their wellbeing and quality of life[11].

Quality of life (QoL) comprises a group of factors which directly influence the way the individual perceives their position in life. Aspects such as financial stability, physical health and productivity, among others, are parameters used to characterize the level of quality of life of an individual. Frail older individuals face a significant decline in performance of activities of daily living which negatively impacts their QoL[3].

Although health professionals are trained to recognize diseases and devise an advance care plan based on clinical diagnosis, approaches in cases of frailty can lack effectiveness. Older individuals with moderate-to-severe frailty are sometimes not recognized as frail by health teams, impacting the planning of interventions to promote health in this contingent of the population[12].

Moreover, QoL is often not taken into account in assessments by professionals, given the invisible nature of the subjective dynamic, yet it represents an aspect that can exert influence on other health outcomes of older individuals. Thus, understanding the relationship between frailty of hospitalized older individuals and quality of life proves important for implementing timely interventions in this group, and helps establish the hypothesis that frailty syndrome can promote negative outcomes from a social and psychological perspective for older patients who are placed in a hospital environment.

Therefore, the objective of the present study was to investigate the relationship between frailty syndrome and quality of life in hospitalized older adults.

METHODS

A quantitative cross-sectional study was carried out at the sectors of Internal Medicine, Surgery, Contagious-Infectious and Parasitic Diseases Unit of the Lauro Wanderley University Hospital (HULW)

in the city of João Pessoa, and in the A surgical, B pneumology and C & D Internal Medicine wards (male and female) of the Alcides Carneiro University Hospital (HUAC) in the city of Campina Grande. Data collection was performed between August 2019 and July 2020.

The study inclusion criteria were older adults aged ≥60 years hospitalized at the institutions outlined above. Exclusion criteria were individuals who were terminally ill, had severe communication difficulty, clinical conditions which precluded participation, or severe cognitive deficit. Cognitive status was based on reports by the professionals of the sector and on observations of the researchers, consistent with criteria given during data collection training.

The study population comprised 774 older patients from the HULW and 485 from the HUAC. Thus, the initial study population consisted of 1259 older participants. Sample size was estimated using the equation for sample calculation in a finite population proportion, with 5% error, 95% confidence interval and 60% phenomenon rate, giving an estimated sample of 285. A further 10% was added to allow for potential losses, giving a final sample size of 323 older individuals. Participant selection was proportional among the different sectors included.

The instruments used for data collection were the Brazil Old Age Schedule (BOAS), allowing sociodemographic characteristics of the study sample to be determined for the parameters age, sex, marital status, literacy, years of education, work status and income[13]. The variables literacy and education were included for their different forms, where literacy served as a qualitative measure for analyzing association and education in years as a quantitative measure for correlation. In addition, the Edmonton Frail Scale (EFS) for classifying frailty[14] and the World Health Organization Quality of Life Group instrument (WHOQOL-OLD)[15] for measuring quality of the participants were applied.

The EFS comprises 9 domains and classifies frailty into frail, pre-frail and not frail based on predetermined cut-off scores. Thus, a scale score of 0-4 indicates not frail, 5-6 pre-frail and ≥7 frail[14]. For this study, a dichotomous classification was employed according to which pre-frail and frail older individuals were pooled and classified as "yes" on the frailty assessment, whereas those rated as not frail were classified as "no". The aim of the researchers was to identify the occurrence of frailty or otherwise.

The WHOQOL-OLD is an instrument developed by the World Health Organization (WHO) for assessing quality of life of older individuals. The questionnaire comprises 24 questions divided into the facets of autonomy, past, present and future activities; death and dying; intimacy; sensory functioning; and social participation. Higher scores indicate better quality of life of the respondent[5]. The cut-off point for this variable was based on the median, where ≤ 85 points indicated low quality of life and scores above this point indicated high quality of life.

The research team underwent previous training prior to conducting data collection. The instruments were applied in a quiet, private environment, without supervision, so as to minimize the risk of embarrassment. The data gathered were double-keyed by two collectors into computers in the research group office at the university.

The data collected were then tabulated and analyzed using statistical software according to descriptive statistics (absolute and relative frequency) and inferential statistics (Pearson´s chi-square, Spearman´s correlation and multiple logistic regression) to analyze association, correlation and regression. A 5% level of significance (p-value < 0.05) was adopted for all statistical analyses.

Normalcy of the distribution was checked by applying the Kolmogorov-Smirnov test for normality, whose results confirmed a tendency toward non-normalcy and defined the use of non-parametric tests.

On the regression analysis, variables with p<0.2 on the association analysis were entered in the model. The hierarchical type regression model was elected, with successive removal of variables with higher p-value. In the final model, however, variables with p<0.05 were retained.

Explanations about the study objectives, secrecy, anonymity and right to refuse to take part were given to all study participants. Subjects that agreed to take part signed, initialed or fingerprinted the

Free and Informed Consent Form. The research project was previously approved by the Research Ethics Committee, in accordance with Resolution no. 466/12, by both the HULW/UFPB (permit no. 3.709.600) and the HUAC/UFCG (permit no. 3.594.339).

RESULTS

The study included 323 older participants, who were predominantly women (60.7%, n=196), aged 60-69 years (49.2%, n=159), had a partner (51%, n=167), were literate (67.8%, n=219), and lived with at least 1 other person (89.2%, n=288). Most participants were not working (78.3%, n=253), and received ≤1 minimum wage (57.9%, n=187). Also, the sample had a high rate of frailty (61%, n=197) and low quality of life (43.2%, n=137).

Regarding the association among frailty, quality of life and sociodemographic variables, there was a statistically significant association of frailty with the variables sex (p=0.027), age (p=0.001), literacy (p<0.001), work status (p<0.001) and income (p=0.001). There was also an association of quality of life with sex (p=0.011) and work status (p=0.006).

A statistically significant association between the variables frailty and quality of life was found, where frail participants had low quality of life (79.6%; n=109) (p<0.001) (Table 2).

Table 1. Distribution of frequency and association of frailty and quality of life with sociodemographic variables. Paraíba state, Brazil, 2019-2020.

Variables	Frailty			Quality of Life		
	Yes n (%)	No n (%)	p-value*	High n (%)	Low n (%)	p-value*
Sex						
Male	68 (53.5)	59(46.5)	0.027	82(65.6)	43(34.4)	0.011
Female	129(65.8)	67(34.2)		98(51.0)	94(49.0)	
Age (years)						
60-69	83 (52.2)	76(47.8)	0.001	86(54.8)	71(45.2)	0.439
70-79	75(64.7)	41(35.3)		70(61.4)	44(38.6)	
≥80	39(81.2)	9(18.8)		24(52.2)	22(47.8)	
Marital status						
No partner	100(64.5)	55(35.5)	0.196	81(53.6)	70(46.4)	0.254
With partner	96(57.5)	71(42.5)		99(60.0)	66(40.0)	
Literacy						
Yes	116(53.0)	103(47.0)	<0.001	128(60.1)	85(39.9)	0.089
No	81(77.9)	23(22.1)		52(50.0)	52(50.0)	
Living arrangement						
Living alone	18(51.4)	17 (48.6)	0.219	18(52.9)	16(47.1)	0.632
Living with other(s)	179(62.2)	109(37.8)		162(57.2)	121(42.8)	
Working						
Yes	21(30.0)	49(70.0)	<0.001	51(73.9)	18(26.1)	0.001
No	176(69.6)	77(30.4)		129(52.0)	119(48.0)	
Income						
≤ 1 MW	129(69.0)	58(31.0)	0.001	95(52.2)	87(47.8)	0.056
> 1 MW	68(50.0)	68(50.0)		85(63,0)	50(37.0)	

Note: * Pearson´s chi-square test; MW: Minimum Wage.

Table 2. Association of frailty with quality of life. João Pessoa city, Paraíba state, Brazil, 2019-2020.

| Variables | Frailty | | p-value |
	Yes n (%)	No n (%)	
Quality of life			
High	84 (46.7)	96(53.3)	<0.001
Low	109(79.6)	28(20.4)	

Note: * Pearson´s chi-square test.

The correlation of frailty and quality of life scores with sociodemographic variables is presented in Table 3. Frailty was positively correlated with participant age (p<0.001), where higher age was associated with greater frailty. Also, frailty was negatively correlated with years of education and income (p<0,001), where lower education and income were associated with higher frailty score. With regard to quality of life score, no statistically significant correlation with other variables was found.

A negative correlation between frailty and quality of life was detected, suggesting that as frailty increased, quality of life decreased, and vice-versa (Table 4).

For the logistic regression analysis, all variables with p< 0.2 were entered in the model (Table 2). The results showed that illiteracy, not working, and low quality of life increased the probability of having frailty syndrome by 3.04 (95%CI= 1.70-5.44; p<0.001), 4.51 (95%CI= 2.39-8.49; p<0.001) and 3.81 (95%CI= 2.22-6.53; p<0.001), respectively. In addition, having no paid work activity also increased the probity of low quality of life by 2.61 (95%CI=1.45-4.73; p = 0.001).

Table 3. Correlation of frailty and quality of life scores with sociodemographic variables. João Pessoa city, Paraíba state, Brazil, 2019-2020.

| Variables | Frailty score | | Quality of Life score | |
	Correlation coefficient	p-value*	Correlation coefficient	p-value*
Age	0.221**	<0.001	0.014	0.802
Years of education	-0.344**	<0.001	0.104	0.064
Number in household	0.025	0.674	-0.010	0.871
Income	-0.228**	<0.001	0.147**	0.009

Note: * Spearman´s correlation test.

Table 4. Correlation of frailty scores and quality of life. João Pessoa city, Paraíba state, Brazil, 2019-2020.

| Variables | Frailty score | |
	Correlation coefficient	p-value*
Quality of Life	-0.448**	<0.001

Note: * Spearman´s Correlation test.

Table 5. Variables associated with frailty and quality of life on adjusted logistic regression. Paraíba state, Brazil, 2019-2020. (N=323)

Variables	OR	CI	p-value*
Frailty			
Literacy			
Yes	1.00	-	-
No	3.04	[1.70 – 5.44]	<0.001
Working			
Yes	1.00	-	-
No	4.51	[2.39 – 8.49]	<0.001
Quality of Life			
Low	3.81	[2.22 – 6.53]	<0.001
High	1.00	-	-
Quality of Life			
Working			
Yes	1.00	-	-
No	2.61	[1.45 – 4.73]	0.001

Note: Frailty: R^2 adjusted: 0.206; Quality of Life: R^2 adjusted: 0.046; OR: Odds Ratio; CI: Confidence Interval; * Significance of test.

DISCUSSION

The present study results revealed a significant association of frailty with gender, age, literacy, work status, income and quality of life. Of these relationships, the correlation was positive for age, and negative for education, income and quality of life. For quality of life, this variable exhibited a significant association with gender, work status and income.

The frailty rate was 61%, where this high percentage of frail individuals can be explained by the susceptibility of older people to physiological declines. These deficits, together with external factors such as diseases, reduced mobility and poor dietary intake, can favor the development of frailty syndrome[16]. At the university hospital affiliated to the Universidade Federal de São Paulo (UNIFESP), a study found a 76.5% frailty rate in older individuals admitted to the ICU, placing a higher nursing workload in the areas of ventilatory and renal support, and intravenous hyperfeeding, particularly on the first day of ICU admission[17].

Similar results have been reported, such as in the study assessing frailty in older users of a Social Assistance Referral Center, which found 33.4% were non-frail, 20.8% apparently vulnerable, and 45.8% frail at some level (mild, moderate and severe)[18].

In the present study, the profile of hospitalized older patients was predominantly female, aged 60-69 years, married or living with someone, and not working, corroborating the results of a study by the Universidade do Chile showing a frailty prevalence 81.1% in females, 55.3% of whom were not working, and a mean age of 68.5 years[2]. The high proportion of older women can be explained by the feminization of aging. The female population, besides having greater life expectancy due to lower susceptibility to occupational and external risks, also has lower alcohol and tobacco use and seeks health services more readily compared with the male population[19].

Moreover, the higher prevalence of frailty in females can be interpreted in the context that older women have a longer life expectancy after the age of 60 years than men, but this longevity does not necessarily translate to good health or quality of life. These additional years can contribute to greater physical disability and development of chronic diseases which change the way women perform their daily activities, rendering them vulnerable to the symptoms of the syndrome.

Socioeconomic disparity proved a factor contributing to a higher rate of frailty. Among the group of frail participants, 69% had an income of

one minimum wage or less. Low educational level associated with low income are factors contributing heavily to the development of the syndrome in older individuals, rendering this group more vulnerable to morbidities and mortality due to their unfavorable social conditions[20].

With regard to the different levels of frailty, participants who were older exhibited greater severity of signs of the syndrome. With increasing age, older people experience more morbidities and, consequently, make greater use of medications. Although the presence of comorbidities is indicative of frailty, their occurrence can precede the syndrome itself, rendering the individual more prone to frailty from 80 years of age or older, with a 1.24 times higher risk of frailty compared to those aged 65-79 years[21,22].

Frailty manifesting with weight loss, functional dependence, slowed gait, exhaustion and fatigue,[23] progresses year by year and worsens with advancing age and health problems[24]. A significant relationship of frailty with hospitalization was found, showing its prevalence in pre-frail and frail older individuals aged over 60 years,[25] revealing an inversely proportional relation with QoL[24].

The correlation of frailty with low socioeconomic level and age found among the study participants points to the need to include social determinants of health in the clinical decision-making of comprehensive geriatric care[7].

With respect to the relationship between frailty syndrome and quality of life, a study of community-dwelling older people showed a strong association that can be influenced by health, environmental and socioeconomic aspects of these individuals[26]. In two Spanish studies, this association was also found to be significant (OR: 0.95; 95%CI: 0.93-0.97) ($R^2 = 0.395$), and that this relationship is strongly influenced by aspects of physical health in frailty syndrome, given the consequences of disability and functional dependence[27,28].

Hospitalization, although necessary for stabilizing the health of older patients in cases of severe frailty, can itself give rise to anxiety, fear and discomfort due to the user´s removal from the family fold, leading to feelings of isolation and impotence amid the process of coping with frail health. Long hospital stays can have negative repercussions and deleterious effects on the health status of older patients, owing to extended periods lying in a hospital bed, sleep deprivation, and iatrogenic events[29].

Nursing has a key role in the care offered to pre-frail and frail older patients. Through continuous monitoring of patients, in conjunction with a screening system, cases can be identified and tools devised to improve outcomes, delay progression of frailty and contribute to patient and family-centered inteventions[30].

Nurses play a key role in identifying the needs of each patient, seeking to contribute to direct continuous care. Effective interventions can allow technologies to be offered that promote care with the aim of avoiding problems caused by frailty and improve the quality of life of frail older people[31].

Nurses, the protagonist in the art of caring, is of critical importance in identifying each individual patient´s needs with the aim of providing follow-up and guidance to older patients and their family members. Nursing enables care promotion, intervention, recovery and rehabilitation, with the goal of enhancing quality of life of each individual according to their circumstances.

The present study has some limitations, such as its cross-sectional design, which precluded drawing meaningful conclusions about the causal relationships between variables, and also the lack of similar studies conducted in the hospital setting and Brazilian milieu against which to compare the present investigation. Many of the instruments used for comprehensive geriatric assessment are designed for the primary care setting and, hence, these should be integrated into all care scenarios involving this population, including hospitals.

CONCLUSION

Frailty syndrome poses a growing challenge to health professionals, where nursing plays a key role in care and management of this condition. Based on the study results, occurrence of the syndrome is associated with lower quality of life of hospitalized individuals, highlighting the need for measures by

hospital managers to improve care beyond the clinical conditions addressed in routine practice.

Elucidating this relationship, the present study results indicate the need to refocus healthcare toward the promotion of quality of life of older people in the hospital setting, whereby the multidisciplinary team can address the psychological and social needs of older patients in this scenario to better define the hospital stay and inform gerontological health practices.

AUTHORSHIP

- Eduarda C. D'Ó. Alves – conception and design, writing of article, data analysis and interpretation, approval of final version for publication.

- Gleicy K. N. Araújo-Monteiro – data analysis and interpretation, critical review, approval of final version for publication.

- Luiza M. Oliveira – data collection, data analysis and interpretation, approval of final version for publication.

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