Evaluation of frailty, functional capacity and quality of life of the elderly in geriatric outpatient clinic of a university hospital

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Abstract

Objective: To investigate the occurrence of frailty and analyze the functional capacity and quality of life in the elderly in a department of geriatrics and gerontology in Belém-PA. *Method:* Cross-sectional, descriptive and analytical study.103 elderly people were assessed as the socio-demographic and clinical aspects, frailty, according to the phenotype of Fried, history of falls, self-perceived health, functional capacity (FC) and quality of life (QOL). The elderly were classified as frail (FR), pre-frail (PF) and non-frail (NF). The groups were compared using the binomial test, Kruskal-Wallis test and ANOVA test, and the relationship between FC and QOL through Pearson correlation. *Results:* The mean age was 73.39(±6.42) years; 23.0% of the elderly were FR, 57.0%were PF and 20.0% were NF. The highest criteria of phenotype were muscle weakness and physical inactivity. Was no difference in FC between FR and PF (p<0.01) and FR and NF (p<0.01). The FR elderly had lower QOL and the highest scores were intimacy (15.33±2.26) and death and dying (14.88±3.26). There were correlation between FC and QOL in groups PF (p=0.0273) and NF (p=0.0017). 62.1% of seniors pointed to health as regular and 34.0% had a history of falling. *Conclusion:* Muscle weakness and physical inactivity were most striking in the development of frailty, which was associated with worse QOL and FC, despite most seniors be independent. These data are important for early detection of determinants of frailty, since the criteria discussed here are reversible.

Key words: Frail Elderly; Quality of Life; Health of the Elderly.

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INTRODUCTION

Population aging, which is a major phenomenon in Brazil, is related to an increase in chronic diseases and geriatric syndromes, such as the syndrome of frailty.[1,2] The study of this condition is therefore of major importance, as it can lead to a reduction in the expectancy for a healthy life and the impairment of the autonomy and independence of the elderly, and hence, a deterioration in quality of life (QOL)[3].

Functional independence is understood as the capacity to perform essential living activities, including caring for oneself, living independently in a house, and carrying out activities that are important for one's QOL[4] while QOL in old age means a perception of well-being through an evaluation of to what extent an individual has realized that which is seen as important for a good life and the degree of satisfaction with what has been achieved until that moment.[5]

As such, the frailty syndrome has the potential to affect all aspects of life of the elderly. Furthermore, it is an event whose effects extend beyond the elderly themselves, placing a burden on relatives and caregivers, and resulting in high health service costs.[3,6]

According to Borges & Menezes,[7] some authors consider only physical indicators when defining frailty among the elderly, while others include cognitive, psychological and environmental criteria. Although there is some heterogeneity, currently the most commonly used definition of the frailty syndrome among the scientific community is that proposed by Fried et al.[4] which considers it to be "a clinical and multifactorial syndrome characterized by a reduction in energy reserves and reduced resistance to stressors, resulting from the cumulative decline of physiological systems".

These authors[4] proposed a frailty phenotype that involves five factors: weight loss, fatigue, muscle weakness, physical inactivity and slowness of gait. A frail elderly individual is someone who exhibits three or more such components, while individuals with one or two components are classified as pre-frail, and have twice the risk of becoming frail.[8] Health professionals should be aware of these aspects, as it is preferable to prevent this syndrome from occurring in the first place than it is to treat a frail elderly person. Early identification of the predictive characteristics that define the syndrome allows the creation of measures that improve the QOL of the elderly person and avoid adverse events, thereby preventing, slowing or stopping the progression of frailty, by improving the care of the elderly.[9]

Considering this information, the present study aimed to investigate the occurrence of frailty among elderly persons treated at a geriatric and gerontology department in Belém, in the state of Pará, as well as analyzing the functional capacity and quality of life of this population.

METHOD

An observational, cross-sectional, descriptive and analytical study was performed. It was approved by the Research Ethics Committee of the Hospital Universitário João de Barros Barreto ("the João de Barros Barreto University Hospital") (HUJBB), under registration n° 267149/2013. Sampling was carried out by the convenience method and included elderly men and women aged 60 years or older who attended the geriatric clinic of the HUJBB between June and September 2013. Elderly individuals with cognitive conditions that would make answering questions difficult or impossible were excluded, as determined by scores below the cutoff points established by the Mini-Mental State Examination (MMSE) adjusted for the level of education[10]. Those with motor impairments that prevented the assessment of gait and who complained of pain, severe dyspnea or other acute symptoms at the time of evaluation were also excluded from the study. Elderly persons who used walking, visual or hearing aids were not excluded.

After signing a Free and Informed Consent Form (FICF), the elderly persons considered fit for the study responded to an interview containing of sociodemographic (age, gender, education, marital status, and others) and clinical (comorbidity, living habits) data, history of falls and self-perceived health condition; followed by an evaluation of frailty using the phenotype proposed by Fried et al[8] Functional Capacity (FC), using the Functional Independence Measure (FIM) validated for the Brazilian population,[11] and QOL, using the World Health Organization WHOQOL-Old scale[12] were measured. The assessments were made by a single trained researcher based on the parameters determined by literature.

For frailness testing, unintentional weight loss was considered the self-reporting of weight loss equal to or greater than 4.5kg or 5% of the weight from the year before, without dietary intervention. Muscle strength was measured by grip strength of the dominant hand measured with Saehan™ brand equipment, with which three measures were taken and the arithmetic average used, with a cut-off point adjusted for body mass index (BMI) and gender.[13]

Self-reported fatigue was evaluated by agreeing "always" or "mostly" (criteria 3 or 4) to two statements: "I lost interest in my usual activities" and "I could not get going" that make up the scale for assessing depression of the Center for Epidemiological Studies (CES-D) in the USA, validated by Tavares et al.[14] Gait velocity was measured by the time spent to cover a distance of 4.6m at a comfortable speed, adjusted for gender and stature,[8] with the acceleration and deceleration parts of walking discarded. Finally, level of physical activity was measured by the short version of the International Physical Activity Questionnaire (IPAQ),[15] adapted for Brazilian elderly individuals,[16] with a time of 150 minutes or less per week spent in moderate and intense activities counting towards a definition of frailty.

After the evaluations, the elderly were classified as frail (FR), pre-frail (PF) and not frail (NF) according to the phenotype.[8] The general data was analyzed with descriptive statistics. The binomial test was used to verify age and comorbidities between the groups. The Kruskal-Wallis nonparametric analysis of variance test was used to compare the groups for gender, FC, perception of health and history of falls. For analysis of intergroup QOL, the parametric one-way ANOVA test was applied. The relationship between FC and QOL was analyzed with the Pearson correlation coefficient. In all cases, a significance level of $p<0.05$ was adopted.

RESULTS

The study consisted of a sample of 103 elderly persons with a mean age of 73.3 (±6.4) years. A total of 73.7% of the group were female; 86.4% came from Belém and metropolitan area; most were married (39.8%) or widowed (36.9%); 88.3% were retired and lived with a mean of 4.0 (±2.0) people in their homes. In terms of educational level, 52.4% were literate.

All the subjects had at least one comorbidity (Table 1), the most common of which were visual disorders (82.5%), systemic arterial hypertension (SAH) (71.8%), insomnia (45.6%) and osteoarthritis (OA) (40.7%).

Table 1. Number of comorbidities reported by elderly persons treated at the geriatric outpatient clinic of HUJBB, classified according to degree of frailty. Belém-PA, 2013.

General	FR	PF	NF
4.5±2.0	5.4±2.3	4.0±1.7	5.0±2.0
p of difference	FR x PF p=0.0033	FR x NF ns	PF x NF ns

Source: researchers. FR= frail elderly persons; PF= pre-frail elderly persons; NF= non-frail elderly persons ns= non-significant p-value

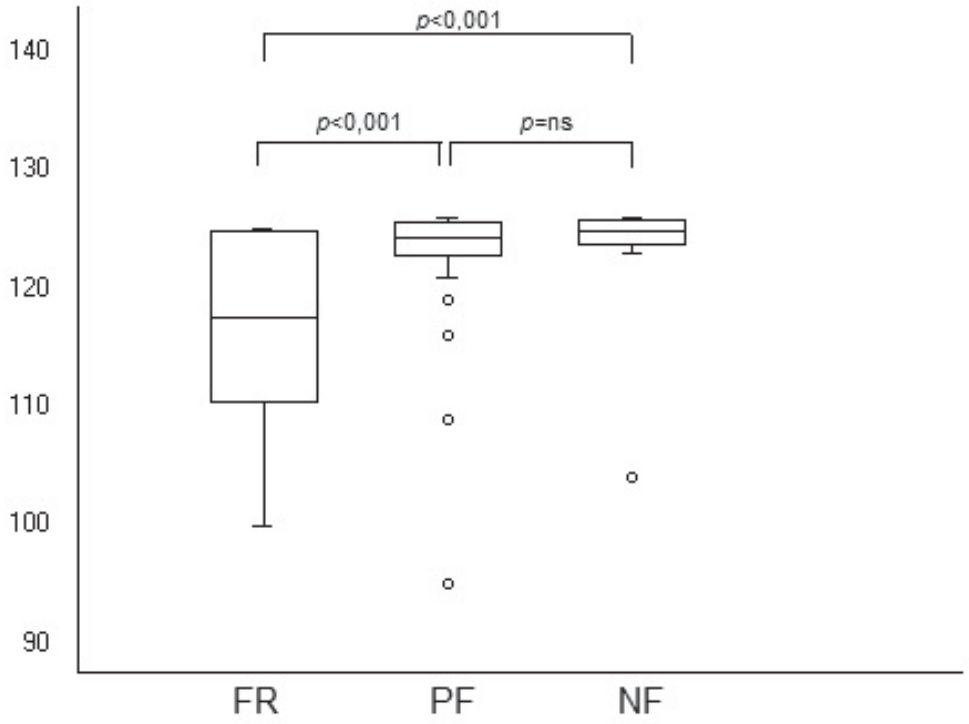
In terms of degree of frailty, 23.0% were considered FR; 57.0% were PF and 20.0% were NF. The mean age of the three groups was similar. There were differences regarding gender only between the PF and NF groups and for the presence of comorbidities between the FR and PF groups.

The FR group had on average 3.5 (±0.7) phenotype points and the highest scoring criteria were muscle weakness and physical inactivity, which were also more frequent in the PF group (Table 2).

Table 2. Domains of phenotype of frailty displayed by elderly persons classified as frail (FR) and pre-frail (PF) treated at the HUJBB outpatient clinic in 2013.

Phenotype points	FR		PF	
	n	%	n	%
Weight loss	7	29.2	4	6.8
Muscle weakness	23	95.8	45	76.2
Fatigue	16	66.6	6	10.1
Physical inactivity	22	91.6	18	30.5
Slowness of gait	17	70.8	7	11.6

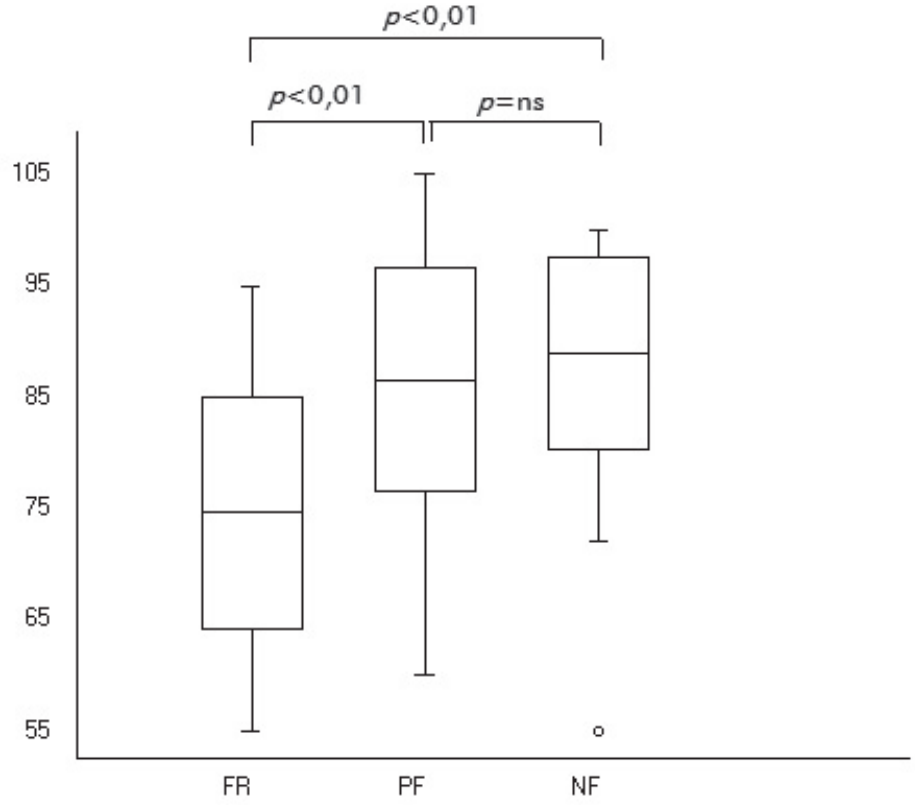
Analysis of FC found that 97.0% of the elderly persons were independent in the performance of activities of daily living (ADLs), and only three individuals had minimum dependency (two in the FR group and one in the PF group). There was a statistically significant difference between the groups FR and PF and between the FR and NF groups in terms of FC (Figure 1).



FR= frail elderly persons; PF= pre-frail elderly persons; NF= non-frail elderly persons

Figure 1. Functional capacity of elderly persons treated at the HUJBB geriatric outpatient clinic by frailty group.

Only 95 elderly persons were assessed for QOL, as interviews that were incomplete or where there was intrusion by companions were excluded. The facets with the highest score were intimacy (15.3±2.2) and death and dying (14.8±3.2), and the lowest score was observed for social participation (13.1±2.6). The elderly persons in the FR group had lower scores than those of the other scores (Figure 2).



FR= frail elderly persons; PF= pre-frail elderly persons; NF= non-frail elderly persons

Figure 2. Quality of life of elderly persons treated at the HUJBB geriatric outpatient clinic by frailty group.

There was a significant correlation between FC and QOL only in the PF (p=0.0273) and NF (p=0.0017) groups, with this correlation being higher in the NF group. The FR group score was p=0.3990.

In terms of the self-reported health of the elderly, the majority said that they had regular (62.1%), followed by good (18.4%) and bad (16.5%) health. Only 2.9% reported having excellent health and there were no reports of bad health. Among the groups there was a significant difference only between FR and PF (p=0.02), showing that FR individuals have a more negative perception of their health than PF individuals.

A total of 34,0% had a history of falling in the previous year, with most of such histories involving only one fall event (80.0%). There was no significant difference when comparing fall events between the three groups (p=0.06).

DISCUSSION

Numerous studies of frailty have argued that women are more susceptible to the development of comorbidities and frailty itself.[8,17] This was not observed in the elderly individuals from the geriatric outpatient clinic of the HUJBB because, although most of the elderly persons were female, there was no statistically significant difference between the three groups in relation to gender, findings that were similar to those of Montero-Odasso.[18]

Although the presence of comorbidities not mean frailty, it may indicate higher chances for the development of the syndrome by altering the health status of the elderly individudal.[9] The elderly persons interviewed in the present study had at least one comorbidity, mainly visual disorders, SAH, insomnia and OA. SAH and OA are among the chronic diseases associated with pain and/or

loss of function most commonly involved with the occurrence of frailty,[19] with heart, kidney and liver failure, cancer, diabetes mellitus, chronic obstructive pulmonary disease, stroke and atherosclerosis,[20] less cited in the present study.

In terms of number of comorbidities, FR elderly persons had more comorbidities than PF individuals, however, there was no significant difference when compared with the NF group, demonstrating that the severity of illness or even treatment aimed at the same may be more associated with frailty than the number of comorbidities only.

The prevalence of frailty identified in the present study was 23.0%, which varies greatly from studies conducted in other states. One study found a prevalence of 20,0% among elderly persons in Paraíba[21], while another identified a prevalence of 31,0% in Rio Grande do Sul[9] and another described 9.1% of people having the condition in Rio de Janeiro.[20] This indicates that frailty can vary greatly among the Brazilian population, perhaps due to cultural diversity and living habits, including diet and physical activity, which are important protective factors against frailty.[22] However, these factors were not the object of this analysis.

When evaluating 100 elderly patients from a geriatric outpatient clinic, Remor et al[9] argued that the occurrence of frailty tends to increase with age, unlike in this study, where there was no significant difference in age between the groups analyzed here. However, in the above study[9] the average age was higher and caregiver reports were considered, which may have influenced the results and caused them to differ from the present findings.

Among the PF and NF elderly, the highest scoring criteria were muscle weakness and physical inactivity, data ratified by Viana et al.[22] who reported that these were the most significant factors in the development of the syndrome of frailty. However, unintentional weight loss was less frequent. Despite the practicality of assessing the nutritional status of the elderly, the effectiveness of this item is compromised in cases of overweight frail elderly individuals, which may explain this result.

The level of physical activity measured in minutes/week was equivalent to results from other studies that address this characteristic through weekly caloric expenditure,[23] demonstrating that is an effective evaluation method for this factor, despite its low reliability.[16] This evaluation methodology was similar to that of Tribess et al,[24] who judged this method useful due to its simplicity and practicality of use, considering the awareness of the elderly.

As has been described by other scientific studies,[21,23] frail elderly persons have a lower FC than non-frail elderly individuals. However, there are differences between the present study and other works[21,23] regarding the argument that frail elderly persons display an incapacity for ADL. The results of the present study support the conclusion that elderly persons can remain independent, even when already at risk of developing frailty, or when already considered frail, as only three of 103 elderly persons here presented minimal dependence. Veras et al.,[25] when investigating predictors of frailty among independent elderly individuals, found that 45,0% of those studied displayed significant indicators for the development of the syndrome. This data reinforces the results of the present study and emphasizes the importance of assessing all elderly persons, even those who are most active in their daily lives, to ensure the early detection or even prevention of the phenomenon of frailty.

Nevertheless, it is important to note that advanced activities of daily living (AADLs), which were not analyzed in this study, are impaired earliest in life, followed by instrumental activities (IADL) and, lastly, basic activities of daily living (BADL)[26] and that the FIM scale used here places greater emphasis on BADL and some IADLs, which in this case are related to getting around and climbing stairs. In general, while the latter domain provided the lowest score among the elderly, these individuals retained their functional independence. Further studies employing specific scales to each of these CF domains to confirm such evidence are suggested.

Although only 95 of the 103 interviewees completed the QOL assessment, it was observed

that FR elderly persons had a lower QOL than PF and NF individuals, showing that frailty can affect the QOL of the elderly, a finding which is in agreement with Bilotta et al.,[27] who advocated the need to consider QOL in frail elderly persons as not only related to physical but also psychosocial aspects. Among the phenotype criteria, slowness of gait is the factor that most affects the physical component of QOL, while fatigue most influences the emotional component.[28]

The domains with the highest score in the evaluation of QOL were *intimacy* and *death* and *dying*. Intimacy revealed a good ability to deal with feelings of love and companionship and good family relationships,[29] which could be related to the degree of interaction of elderly persons who have an average of four people in their homes. The domain *death* and *dying* displayed a coping capacity in relation to death, and a greater concern about the risk of suffering that precedes it. On the other hand, the lowest score was associated with *social participation*, similar to the findings of Torres et al.,[30] indicating that these elderly individuals participate little in outdoor activities in the community and are more concerned with family relationships.

An important finding was the similarity of FC and QOL results between PF and NF elderly persons, or in other words those at risk of developing frailty had the same scores as elderly individuals without this risk, indicating that preventive interventions can be extremely effective even among pre-frail elderly persons.

There was a correlation between FC and QOL in the PF and NF groups, showing that being functionally independent is a good determinant of both the physical and mental aspects of quality of life.[30] In addition, the data indicated that this correlation is stronger in NF elderly persons.

A negative perception of health is strongly associated not only with the development of the syndrome of frailty, but also with high rates of morbidity and mortality.[19,31] In the present study, most elderly persons considered their health to be regular, and there was no difference among FR and PF individuals. While this finding agreed with the aforementioned studies,[19,31] there was no difference between FR and NF and between PF and NF individuals, suggesting that even elderly individuals not at risk of frailty may have a negative opinion of their health, or in other words, in this sample perception of health was not decisive for frailty and vice versa. This is possibly due to the low number of reports of poor (16.5%) or very poor (0.0%) health, categories which, according to Stori et al.,[32] are determinants of frailty.

Although literature has identified a relationship between a history of falls and frailty,[33] this was not observed in this sample, as there was no difference between the F, PF and NF groups. Moreira and Lourenço[20] argued that only a history of three or more falls, which define the elderly individual as a faller, is directly linked to frailty, which may explain the lack of an association here, as in addition to the rate of falls being low, 80% of these elderly individuals had a history of only one fall.

This study was limited by the exclusion of elderly people with cognitive impairment, which is considered a factor for the development of the syndrome of frailty. Instead, the focus was aimed at the reports of the elderly persons themselves in relation to their health and well-being. It is believed that in this way the data becomes more reliable.

The reduced sample size is another limitation that hinders the generalization of the results presented here to other populations, and also meant that it could not be determined whether frailty can cause functional incapacity, or vice versa. In fact, either situation can occur, depending on the context and the life history of the elderly. What is known is that both can affect QOL, and so each case must be assessed individually, considering the lifestyle of each person, to reach correct conclusions, requiring studies with larger sample sizes and longitudinal approaches.

Therefore, the results indicate the need to recognize risks related to frailty even in older people who do not have clear manifestations of the condition, in order to prevent the advance or the emergence of the syndrome, and to ensure a better QOL for as long as possible, as for elderly

persons it is more important to live with quality, than simply to live for a long time.[34]

CONCLUSION

Compared to other Brazilian studies, the degree of frailty was relatively high among the elderly population studied. Muscle weakness and physical inactivity proved to be the most significant factors for the development of the syndrome, which was associated with reduced functional capacity and quality of life, although most elderly persons remained independent. Thus, the most important findings of the present study relate to the need to recognize the determinants of frailty, even those that are subclinical, in order to detect the emergence of this syndrome as early as possible, since the biological criteria discussed herein are reversible.

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