

ORIGINAL ARTICLE

COGNITION AND FRAILITY IN COMMUNITY-DWELLING ELDERLY

Renata Rabelo Pereira¹, Cleane Rosa Ribeiro da Silva², Selene Cordeiro Vasconcelos³, Lucineide Alves Vieira Braga⁴, Edilene Araújo Monteiro⁵, Maria de Lourdes de Farias Pontes⁶

ABSTRACT

Objective: To analyze the relationship between cognitive performance and frailty in community-dwelling elderly.

Method: Cross-sectional, observational and quantitative study conducted in August-December 2016, with 126 elderly registered in a Family Health Unit of João Pessoa, state of Paraíba. Mini Mental State Examination (MMSE) was used for cognitive assessment and the Edmonton Frailty Scale was used for the assessment for frailty. Descriptive and inferential analysis were performed, and Pearson's chi-square test of independence, Nonparametric Spearman and Kendall tests and Cramér's V Coefficient and Odds Ratio (OR) tests were applied.

Results: The cognitive performance assessment revealed that 24 (19%) elderly had cognitive impairment and 50 (39.6%) were frail. Elderly people with cognitive impairment were 2.56 (95% CI: 0.55-0.96) more likely to be frail.

Conclusion: There was a statistically significant relationship between cognitive performance and frailty among community-dwelling elderly, demonstrating that older people with cognitive impairment are more likely to be frail.


DESCRIPTORS: Geriatric nursing; Cognition; Elderly; Frail elderly.


HOW TO REFERENCE THIS ARTICLE:


Pereira RR, CRR da, Vasconcelos SC, Braga LAV, Monteiro EA, Pontes M de L de F. Cognition and frailty in community-dwelling elderly. *Cogitare enferm.* [Internet]. 2019 [access "insert day, month and year"]; 24. Available at: <http://dx.doi.org/10.5380/ce.v24i0.60578>.




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¹Nurse. Master in Nursing. Universidade Federal da Paraíba. João Pessoa, PB, Brazil. 

²Nurse. Master in Nursing. Universidade Federal da Paraíba. João Pessoa, PB, Brazil. 

³Nurse. PhD, Neuropsychiatry and Behavioral Sciences. Nursing Professor from Universidade Federal da Paraíba. João Pessoa, PB, Brazil. 

⁴Nurse. Doctoral Nursing Student. Universidade Federal da Paraíba. João Pessoa, PB, Brazil. 

⁵Nurse. PhD, Nursing. Nursing Professor from Universidade Federal da Paraíba. João Pessoa, PB, Brazil. 

⁶Nurse. PhD, Nursing. Nursing Professor from Universidade Federal da Paraíba. João Pessoa, PB, Brazil. 

COGNIÇÃO E FRAGILIDADE DE IDOSOS DA COMUNIDADE

RESUMO

Objetivo: analisar a relação entre o desempenho cognitivo e a fragilidade de idosos da comunidade.

Método: estudo transversal, observacional e quantitativo, realizado no período de agosto a dezembro de 2016, com 126 idosos cadastrados em uma Unidade de Saúde da Família de João Pessoa-PB. O Mini Exame do Estado Mental foi utilizado para a avaliação cognitiva e a Escala de Fragilidade de Edmonton para a fragilidade. Foi realizada análise descritiva e inferencial, aplicaram-se testes de Qui-Quadrado de Independência, Spearman, Kendall, Coeficiente de Cramér e Razão de Chance.

Resultados: na avaliação do desempenho cognitivo, verificou-se que 24 (19%) idosos manifestaram déficit cognitivo e 50 (39,6%) demonstraram ser frágeis. Os idosos com déficit cognitivo apresentaram 2,56 (IC95%: 0,55-0,96) mais chance de serem frágeis.

Conclusão: evidenciou-se relação estatística significativa entre o desempenho cognitivo com a fragilidade em idosos da comunidade, evidenciando que idosos que têm déficit cognitivo apresentam maior probabilidade de serem frágeis.

DESCRITORES: Enfermagem geriátrica; Cognição; Idoso; Idoso fragilizado.

COGNICIÓN Y FRAGILIDAD DE ANCIANOS DE LA COMUNIDAD

RESUMEN

Objetivo: analizar la relación entre el desempeño cognitivo y la fragilidad de ancianos de la comunidad.

Método: estudio trasversal, observacional y cuantitativo, que se realizó en el periodo de agosto a diciembre de 2016, con 126 ancianos registrados en una Unidad de Salud de Familia de João Pessoa, PB. Se utilizó el Mini Examen de Estado Mental para la evaluación cognitiva y la Escala de Fragilidad de Edmonton para la fragilidad. Se realizó análisis descriptivo y de inferencia, además de la aplicación de pruebas de Chi Cuadrado de Independencia, Spearman, Kendall, Coeficiente de Cramér y Razón de Chance.

Resultados: en la evaluación del desempeño cognitivo, se verificó que 24 (19%) ancianos manifestaron déficit cognitivo y 50 (39,6%) demostraron fragilidad. Los ancianos con déficit cognitivo presentaron 2,56 (IC95%:0,55-0,96) más probabilidad de fragilidad.

Conclusión: se evidenció relación estadística significativa entre el desempeño cognitivo y la fragilidad en ancianos de la comunidad, apuntando que ancianos que tienen déficit cognitivo presentan más probabilidad de ser frágiles.

DESCRIPTORES: Enfermería geriátrica; Cognición; Anciano; Anciano fragilizado.

INTRODUCTION

Population aging is discussed worldwide by researchers from various fields due to the need to elaborate strategies that contribute to healthy and active aging.

The elderly population has grown in developing countries, making it necessary to develop policies targeted to this population, as new demands for care arise with changing morbidity and mortality patterns⁽¹⁾. Frailty in the elderly is one of these challenges faced today⁽²⁾.

The term frailty has been highlighted in recent decades in studies on aging, and although widely used, there is no consensus on its definition. Thus, frailty is characterized as an evolving concept with various operational definitions, based on different theoretical models, which makes the understanding of this process more complex⁽²⁾. The group Canadian Initiative on Frailty and Aging (CIF-A) based its construct of frailty on a holistic and multidimensional approach, determined by biological, psychological and social factors related to the life course of the elderly⁽³⁾.

Frail individuals make up a subset of older people who are more susceptible to unfavorable health outcomes such as death, disability and hospitalization because of their reduced ability to respond to adverse conditions that predispose them to chronic diseases, anorexia, sarcopenia, osteopenia, addictions and cognitive deficits⁽⁴⁾.

Cognitive disorders are often associated with frailty in the elderly⁽⁵⁻⁷⁾. This population usually complains of forgetfulness and other cognitive disorders. Studies show that in addition to the impact on memory, aging can be related to the decline of executive functions and language⁽⁵⁻⁷⁾. Disorders in cognitive functions, along with social, economic, demographic and health variables, may be risk factors for frailty⁽⁵⁾.

In the developing countries of Latin America, including Brazil, the aging process has a negative impact on health, economic and social aspects, with a predominance of frailty ranging from 7.7% to 42.6%⁽⁸⁾. This variation is caused by the criteria adopted for screening the syndrome, as well as by the different sociodemographic and cultural characteristics, which may lead to different percentages of frailty⁽⁹⁾. In-depth studies should be conducted on frailty in elderly people to identify preventable factors associated to this process, as well as to support the development of appropriate interventions^(3-4,9).

Thus, the frailty syndrome has been the focus of studies in the field of gerontology, given its impact on elderly individuals, their families and society. Despite recent initiatives, few studies were conducted in Brazil on the relationship between cognitive performance and frailty in the elderly. Thus, in view of the fast and complex increase in the elderly population, and because this population group is more likely to develop frailty, cognitive disorders, with multiple chronic or disabling conditions, the present study aims to investigate the relationship between cognitive performance and frailty among community-dwelling elderly.

METHOD

Cross-sectional, observational and quantitative study conducted in a Family Health Unit of the city of João Pessoa, state of Paraíba (PB).

The following criteria were established for participation in the study: Individuals aged 60 years or older, of both sexes, being registered in the selected Family Health Unit and able to answer the questions included in the data collection instruments. Elderly people with previously diagnosed dementia, communication and hearing disorders or bedridden were excluded from the study due to the impossibility of application of the Edmonton Frailty Scale.

The study population was composed of 186 individuals. Sample size was established with the use of the finite population correction factor, with 95% confidence intervals ($\alpha = 0.05$, which gives $Z_{0,05/2}=1.96$), estimated prevalence of 50% ($p = 0.50$) and margin of error of 5% ($\text{Error} = 0.05$), which corresponded to 126 participants.

Data was collected between August and December 2016, through interviews with the subjects at their homes. The interviews lasted approximately 40 minutes and were conducted by well-trained researchers accompanied by a Community Health Agent. A semi-structured instrument was used to obtain data related to the sociodemographic profile, the Mini Mental State Examination (MMSE) and the Edmonton Frailty Scale.

The MMSE, translated and validated for the Brazilian population⁽¹⁰⁾ was used to assess the cognitive function of the elderly. It is a semi-structured test composed of questions grouped into seven categories and aimed at evaluating specific functions, as follows: temporal orientation (05 points), spatial orientation (05 points), short-term memory (03 points), calculation and attention (05 points), evocation of words (03 points), language (08 points) and visual construction (01 point). The total score may vary from zero to 30 points, and the cutoff points are selected according to the respondent's schooling: 13 points for illiterate people, 18 points for low (from 1 to 4 incomplete years) and average education (from 4 to 8 incomplete years) and 26 for high education (> 8 years)⁽¹⁰⁾.

The Edmonton Frailty Scale (EFS) was used to measure the degree of frailty of the elderly. The scale was developed at the University of Alberta, Edmonton, Canada, translated and validated in Brazil in 2008⁽¹¹⁾. It aims to evaluate nine domains: cognition, general health, functional independence, social support, medication use, nutrition, mood, continence and functional performance. The total score ranges from 0 to 17 points, with 17 representing the highest level of frailty. The elderly are classified to the score obtained: 0-4, without frailty; 5-6, apparently vulnerable; 7-8, mild frailty; 9-10, moderate frailty; 11 or more, severe frailty⁽⁶⁾. This variable can also be dichotomized into frail (mild, moderate and severe frailty) and non-frail (non-frail and is apparently vulnerable), and a seven-point cutoff was considered to classify an individual as frail⁽¹¹⁾.

Data were entered and organized in Excel and later analyzed in Software R using descriptive and inferential statistics. Kolmogorov-Smirnov test was used to verify the distribution of the variables Pearson's chi-square test of independence was used for the association between dichotomous variables. Nonparametric Spearman and Kendall tests and Cramér's V coefficient tests were used in the analysis of the relationship between the variables. Also, Odds Ratio (OR) was used with a 95% confidence interval.

The study met the standards of Resolution 466/12⁽¹²⁾ on research involving human beings and was approved by the Ethics Committee of Centro de Ciências da Saúde da Universidade Federal da Paraíba, under protocol no 1.702.542.

RESULTS

Of the 126 elderly participants in the study, 90 (71.4%) were female, 61 (48.4%) said they were aged 60-69 years and 53 (42.1%) said they were married. Regarding the living arrangement, 40 (31.6%) elderly lived with their spouses. Regarding education (schooling), 63 (50%) said they were illiterate and 60 (47.6%) had a family income of 1 to 3 minimum wages.

Regarding the assessment of cognitive performance, most participants did not have cognitive impairment: 102 (81%) and 24 (19%) had cognitive impairment (Table 1).

Table 1 – Cognitive performance of community-dwelling elderly. João Pessoa, PB, Brazil, 2016

Cognitive performance	n	%
No cognitive deficit	102	81
With cognitive deficit	24	19
Total	126	100

Regarding the assessment of frailty, the results showed that the highest percentage of elderly were not frail: 76 (60.4%); 39 (31%) showed no frailty and 37 (29.4%) were apparently vulnerable. Among those who were frail, 50 (39.6%) showed a predominance of mild frailty: 32 (25.4%) (Table 2).

Table 2 – Distribution of frailty rating of community-dwelling elderly. João Pessoa, PB, Brazil, 2016

Frailty rating	n	%
Not frail	76	60.4
Did not show frailty	39	31
Apparently vulnerable	37	29.4
Frail	50	39.6
Mild frailty	32	25.4
Moderate frailty	16	12.7
Severe frailty	2	1.5
Total	126	100

When cognitive status was related to frailty, statistical significance was identified between the variables, both in the classification of the degree of frailty into 5 categories (Table 3) and dichotomously (Table 4). Spearman and Kendall tests showed similar P-values (0.023) and positive association measures ($\rho = 0.203$ and $\tau = 0.186$) (Table 3), and Pearson's Chi-square had a p value of 0.065, Contingency coefficient C positive, showing a not so strong relationship, but presented a significant odds ratio of 2.56 (Table 4). These results show that elderly with cognitive impairment are more than twice as likely to be frail elderly.

Table 3 – Association between degree of frailty and cognitive status of elderly in the community. João Pessoa, PB, Brazil, 2016

Cognitive state	Degree of Frailty										p Value and measure of strength of association
	No Frailty		Apparently Vulnerable		Mild Frailty		Moderate Frailty		Severe Frailty		
	n	%	n	%	n	%	n	%	n	%	
Has cognitive deficit	4	10.3	6	16.2	8	25	5	31.3	1	50	0.023* $\rho=0.203^*$
Does not have cognitive deficit	35	89.7	31	83.8	24	75	11	68.7	1	50	0.023** $\tau=0.186^{**}$

* Spearman Test **Kendall Test

Table 4 – Association between dichotomized degree of frailty and cognitive status of community elderly. João Pessoa, PB, Brazil, 2016

Cognitive performance	Dichotomized Degree of Frailty				P-value
	No frailty detected or is apparently vulnerable (score<7)		Mild, moderate or severe frailty (score≥7)		Cramér's coefficient
	n	%	n	%	Odds ratio (IC95%)
Has cognitive deficit	10	13,2	14	28	0.065* C=0.164
Does not have cognitive deficit	66	86.8	36	72	OR=2.56 (0.55-0.96)

* Pearson's chi-square test of independence C: Contingency coefficient OR: Odds Ratio

DISCUSSION

Most participants in the study were women. Similar results were found in a population-based epidemiological study of 2055 elderly people⁽¹³⁾ and in a study that tracked health problems tracking in the elderly in primary care⁽¹⁴⁾. This pattern reflects the process of feminization of old age, which is characterized by the predominance of women in the elderly population (13-14), a situation that has been widely analyzed and discussed.

More than half of the elderly population in all regions of the world are women and it is estimated that women live on average five to seven years longer than men. According to epidemiological data from Brazil, the percentage of women in the elderly population increased from 2.2% in 1940 to 4.7% in 2000 and 6% in 2010⁽¹⁵⁾.

The predominant age group in the sample was composed of young-old individuals. According to data from the Brazilian Institute of Geography and Statistics (IBGE), the largest percentage of the elderly in the Brazilian population is between 60-69 years old, but the

percentage of elderly aged 70 or older has increased⁽¹⁶⁾.

Most of the elderly who participated in the study were married. Similar results were obtained in a study with elderly in Primary Care⁽¹⁷⁾. Regarding living arrangement, there was a predominance of elderly who reported living with their spouses, which contrasts with findings from other studies⁽¹⁷⁻¹⁸⁾.

Regarding education, it was found that most elderly were illiterate. This can be explained by the fact that access to school was usually difficult in the past, and by cultural factors: work was considered more important than education at school⁽¹⁹⁾. With regard to income, it was found that the participants earned 1 to 3 minimum wages. Other studies reported low financial status and lower educational achievement among older people^(17,20).

Elderly people with a higher educational level and who earn higher salaries are usually more likely to adhere to self-care practices, including the correct use of medicines, means of transportation and communication, while those with lower salaries and a lower educational level are more susceptible to diseases and, consequently, are more likely to have a poor health status^(18,21).

Most of the elderly had no cognitive deficit. This data corroborates studies conducted in elderly residents who lived in their homes^(2,5,22). Regarding frailty, there was a higher percentage of non-frail elderly. In the adaptation and validation of the Edmonton Frailty Scale to Brazil, the frequency of non-frail elderly was 68.6%⁽¹¹⁾. A study with elderly who lived in Ribeirão Preto, São Paulo, found that 62.1% of participants did not have frailty⁽²³⁾.

The high percentage of elderly who were not frail and had no cognitive impairment can be explained by the predominance of young-old elderly in the sample. According to the literature, age is a predictor of frailty and cognitive impairment, demonstrating that the oldest-old are more vulnerable to these disorders^(5,9,23-24).

When frailty was related to the presence or absence of cognitive impairment, the results showed a statistically significant association between these variables, demonstrating that elderly people with cognitive impairment are more likely to be frail. These data corroborate other studies that found that cognitive disorders could be directly related to frailty^(1,24-25).

A population-based study conducted with elderly people who lived in their homes in two Brazilian municipalities, João Pessoa - PB and Ribeirão Preto-SP, showed that decreased cognitive performance correlated with increased frailty in both cities⁽²⁵⁾. A longitudinal study with 1,045 elderly people in China found that frail older people are 2.28 (95% CI: 1.02-5.08) times more likely to have cognitive impairment⁽²⁶⁾.

Cognitive and physical damage is frequent in the oldest-old and can be intensified by the effects of the aging process and/or the presence of chronic morbidities⁽²⁷⁾. Elderly people with impaired cognitive performance often find it more difficult to eat, exercise, walk, which can lead to weight loss and impaired motor functions, favoring the onset and progression of the frailty syndrome⁽²⁸⁾.

A prospective cohort study with 1,751 community-dwelling elderly over a five-year period showed a mortality risk of 2.17 (95% CI: 1.69-2.80) in elderly with cognitive impairment; of 2.02 (95% CI: 1.53-2.68) among the frail, and for the elderly who had both conditions the risk increased to 3.57 (95% CI: 2.75-4.62)⁽²⁹⁾. This demonstrates that frailty and cognitive impairment were predictors of the mortality rate in the elderly, and the coexistence of these diseases is even more harmful⁽²⁹⁾.

In view of the aforementioned, in the context of nursing, it is essential to include the assessment and monitoring of cognitive performance and frailty in the care process of the elderly. This favors the identification of risk groups and supports the planning of care, with effective prevention and promotion actions and interventions, in order to prevent and/or reduce health problems, providing improvements in the living conditions of this population

segment^(4,25-26).

One limitation of the present study is its cross-sectional design, which did not allow establishing a cause-effect relationship between the variables. Longitudinal studies are suggested to investigate the long-term impact of cognitive impairment, frailty and its presence on the lives of the oldest old.

CONCLUSION

The results of this study revealed a statistically significant association between cognitive performance and frailty of community-dwelling elderly. Cognitive deficit has been identified as a risk factor for frailty syndrome.

Therefore, periodical assessment of cognitive performance and frailty in older people, through validated instruments such as the Mini Mental State Examination and the Edmonton Frailty Scale is essential for the identification of disorders and early intervention.

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Received: 18/07/2018

Finalized: 08/08/2019

Corresponding author:

Cleane Rosa Ribeiro da Silva

Universidade Federal da Paraíba

Cidade Universitária, s/n - 58051-085, João Pessoa, PB, Brasil

E-mail: cleane_rosas@hotmail.com

Role of Authors:

Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work - RRP, CRRS, SCV, LAVB

Drafting the work or revising it critically for important intellectual content - RRP, CRRS, SCV, EAM

Final approval of the version to be published - LAVB, MLFP

Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved - MLFP