






Assessment of cognitive status and functional capacity in institutionalized older adults

Avaliação do estado cognitivo e capacidade funcional em pessoas idosas institucionalizadas

Evaluación del estado cognitivo y capacidad funcional en ancianos institucionalizados

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ABSTRACT

Objective: to analyze the relationship between cognitive status, level of functional capacity and socioeconomic factors among institutionalized older adults. **Method:** in this quantitative cross-sectional study of older adults in long-stay institutions for the elderly, the instruments used were the Brazil Old Age Schedule questionnaire, the Mini Mental State Exam, and the Advanced Activities of Daily Living, Instrumental Activities of Daily Living, and Basic Activities of Daily Living scales. The data were analyzed using descriptive and inferential statistics. **Results:** cognitive deficit predominated among participants who were elderly males (50.0%), up to 70 years old (57.1%), literate (58.6%), in a relationship (66.7%), childless (60.5%) and with income of more than one minimum wage (66.7%). Most older adults with deficits scored lower in advanced activities (71.9%), independence in instrumental activities (55.6%) and dependence in basic activities (71.1%). **Conclusion:** cognitive deficit is related to functional capacity, and is lower in more active elderly people with higher levels of independence.

Descriptors: Aged; Health of Elderly; Homes for the Aged; Activities of Daily Living.

RESUMO

Objetivo: analisar a relação entre o estado cognitivo, o nível de capacidade funcional e os fatores socioeconômicos entre pessoas idosas institucionalizadas. **Métodos:** estudo quantitativo, transversal, desenvolvido com pessoas idosas em Instituição de Longa Permanência para Idosos (ILPI). Os instrumentos utilizados: questionário *Brazil Old Age Schedule*; Mini exame do Estado Mental; escalas de Atividades Avançadas de Vida Diária, Atividades Instrumentais de Vida Diária e Atividades Básicas de Vida Diária. A análise foi realizada através de estatística descritiva e estatística inferencial. **Resultados:** predominou o déficit cognitivo entre pessoas idosas do sexo masculino (50,0%), até 70 anos (57,1%), alfabetizados (58,6%), em um relacionamento (66,7%), sem filhos (60,5%) e com renda superior a um salário mínimo (66,7%). A maioria das pessoas idosas com déficit tem menor nível nas atividades avançadas (71,9%), independência nas atividades instrumentais (55,6%) e dependência nas atividades básicas (71,1%). **Conclusão:** o déficit cognitivo relaciona-se com a capacidade funcional, sendo menor em pessoas idosas com maior nível de independência e mais ativos.

Descritores: Idoso; Saúde do Idoso; Instituição de Longa Permanência para Idosos; Atividades Cotidianas.

RESUMEN

Objetivo: analizar la relación entre estado cognitivo, nivel de capacidad funcional y factores socioeconómicos entre ancianos institucionalizados. **Métodos:** estudio cuantitativo, transversal, desarrollado junto a ancianos en Instituciones de Larga Estancia para Ancianos (ILPI). Los instrumentos utilizados: Cuestionario *Brazil Old Age Schedule*; Mini examen del estado mental; escalas de Actividades Avanzadas de la Vida Diaria, Actividades Instrumentales de la Vida Diaria y Actividades Básicas de la Vida Diaria. El análisis se realizó mediante estadística descriptiva y estadística inferencial. **Resultados:** Predominó el déficit cognitivo entre los hombres ancianos (50,0%), hasta los 70 años (57,1%), alfabetizados (58,6%), que están en pareja (66,7%), sin hijos (60,5%) y con ingresos superiores a un salario mínimo (66,7%). La mayoría de los ancianos con déficit tiene un menor nivel en actividades avanzadas (71,9%), independencia en actividades instrumentales (55,6%) y dependencia en actividades básicas (71,1%). **Conclusión:** el déficit cognitivo está relacionado con la capacidad funcional, siendo más bajo en ancianos con mayor nivel de independencia y más activos.

Descritores: Anciano; Salud del Anciano; Hogares Para Ancianos; Actividades Cotidianas.

INTRODUCTION

The aging process affects each individual in a unique way and can bring changes in the lives of older adults. Morphological, functional and biochemical transformations are inherent to the aging process and directly influence the ability to perform daily activities. A decrease in neuromotor capacity leads to a progressive loss of autonomy, increases the dependence level, and therefore vulnerability¹.

Cognition is a psychological function of knowledge acquisition through processes such as stimuli perception, reasoning and forming responses to external stimuli. Loss of cognition is mainly an effect of impairment in the central

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nervous system which occurs with advancing age. This process is gradual, and has a higher incidence in people over 80 years old².

The loss of cognitive functions is a consequence of the aging process and can be enhanced by health problems. Thus, the way you get older is crucial for the progression of the cognitive state. Another effect of cognitive deficit is functional decline, thus impairing the ability to develop daily activities and consequently decreasing autonomy³.

The decline in functional capacity is related to a reduction in the power to decide and act in daily activities. The deficit of this aptitude refers to the lack of autonomy and independence to be able to manage one's own life, therefore an incapacity for self-care. The increase in an older adult's dependence makes them more vulnerable to physical, psychological or financial abuse⁴.

A decrease in cognitive status and functional capacity are processes which directly lead to a lack of autonomy and independence. Thus, the inability to perform daily activities increases the need for monitoring by the family or a professional. The stress caused among family members and the lack of conditions for home care are sometimes reasons for institutionalization⁵.

Referring older adults to nursing homes takes place under conditions of need for professional monitoring. These entities are collective residences that serve older adults with or without family support, as well as those with difficulties in performing daily activities who need long-term care⁴.

Older adults adapting to nursing homes is a process full of changes which are not only environmental, but also social. The change in the subject's family position, in addition to the abrupt relocation, promotes a situation of vulnerability and psychological stress to the subject. These daily changes and the insertion of new habits accentuate cognitive impairment⁶.

This study is justified by the need to identify and describe which factors are related to cognitive deficit and functional capacity in older adults residing in nursing homes. Given this context, the study aimed to analyze the relationship between cognitive status, functional capacity level and socioeconomic factors among institutionalized older adults.

LITERATURE REVISION

Population aging is a process that occurs worldwide, but it is not considered a recent effect, given that countries like Portugal and France have been living with the consequences of this process for several decades. However, it can be considered relative that the World Health Organization (WHO) considers that older adults in developing countries are those aged over 60 years^{1,3}.

This process is characterized by physiological decline, and therefore results in decreased functional capacity, cognitive deficit and the onset of chronic diseases. These aging effects result in dependence on Activities of Daily Living (ADL) and the functions involved in the cognitive process, such as learning and memory^{3,5}. Thus, maintaining independence in ADL and cognitive capacity is not only related to disease prevention, but also to the possibility of well-being and quality of life for older adults. The continuity of functional capacity depends on an individual's ability to adapt to the physical, mental and social challenges that inevitably occur throughout life, and likewise this occurs during institutionalization⁴⁻⁶.

The study of cognitive and functional capacity in nursing homes represents the basis for promoting their own health and managing the home environment by older adults, taking into account the lack of research in the area and noting that a deficit in these areas represents a risk of violence, dependency, mortality and hospitalization⁴⁻⁶.

METHOD

This was a quantitative, descriptive, cross-sectional study guided by the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) tool. It was carried out in two philanthropic institutions located in the city of João Pessoa, PB, Brazil, from 2018 to 2019.

All individuals aged 60 years or older residing in the study institutions were included. Those who were unable to answer the questions participated with the supporter or responsible caregiver. The study sample consisted of 90 older adults.

Researchers were trained to carry out adequate, responsible and impartial data collection with research participants. On that occasion, the research, its objectives, the instruments for data collection and the Informed

Consent Form (ICF) were presented. All doubts were resolved during the training. The training lasted a total of eight hours.

Data collection was carried out between August and October 2018 at the nursing homes in a reserved place, free from interruptions and external interference, where the older adult was free to answer the questionnaires together with the researchers or accompanied by the caregiver, who responded to the questionnaire regarding their situation. Data collection took place after the researchers' presentation, clarification on the objectives and confidentiality of the data, availability to participate and signing the ICF.

The following instruments were used for data collection: Brazil Old Age Schedule (BOAS) questionnaire, applying the questions corresponding to socioeconomic conditions⁷; the Mini Mental State Examination (MMSE), for cognitive assessment⁸; the Instrumental Activities of Daily Living (IADL)⁹, Basic Activities of Daily Living (BADL)¹⁰ and the Advanced Activities of Daily Living (AADL)¹¹ scales for measuring functional capacity.

The BOAS scale is defined as a multidimensional tool with applicability for the older adult population, which has a high level of acceptability and can generate information such as: physical and mental aspects; measure economic level; and identify the social situation⁷. This scale was used with the intention of investigating situations related to the social and economic profile of older adults.

The MMSE is a brief cognitive screening test for identifying dementia consisting of 30 items. The items evaluated by the MMSE are: orientation, immediate memory, attention and calculation, recall memory and language⁸. Its choice was based on the history of use by renowned researchers in different countries. It enables evaluating the cognitive deficit of older adults.

The older adults' functional capacity was evaluated using 3 scales, namely the Katz index for the BADL¹¹, the Lawton and Brody scale for evaluating the IADL⁹, and the AADL. The first is regarding autonomy in relation to self-care activities (eating, bathing, etc.); the second is aimed at activities that involve greater freedom in carrying out activities (driving, shopping, going to the bank, etc.). The third scale (AADL) is applied to measure the insertion of older adults in social participation, voluntary, and educational activities, meaning activities which depend on the interest of the older adult¹².

The collected data were tabulated and analyzed using the SPSS version 26.0 software program. Data were double entered, which means two entries into different spreadsheets by 2 different typists in order to reduce consistency and typing errors. After completing the data entry, the two databanks were compared in order to minimize typing errors.

Data were analyzed using descriptive statistics by frequency distribution, and inferential statistics through association and correlation tests. The significance level used for all statistical tests was 5% (p -value<0.05). Pearson's chi-squared, Fisher's exact and Pearson's correlation tests were used. The parametric test was used because the Kolmogorov-Smirnov Test result presented a distribution with a tendency to normality. The study was approved by the Research Ethics Committee of the institution, meeting the ethical precepts of research with human beings.

RESULTS

Table 1 shows data on the association of sociodemographic data with cognitive impairment.

There is a predominance among older males (50.0%; $n=12$) aged 60 to 70 years (57.1%; $n=8$), literate (58.6%; $n=34$), with a relationship (66.7%; $n=4$), without children (60.5%; $n=23$) and receiving more than one minimum wage (66.7%; $n=6$).

Table 2 demonstrates the association of functional capacity and cognitive deficit.

It was possible to identify that most older adults with deficits were the least active and had greater difficulty in advanced activities (71.9%; $n=23$), independent in instrumental activities (55.6%; $n=5$) and dependent on basic activities (71.1%; $n=27$). There is a significant association between cognitive deficit and advanced and basic activities from a statistical point of view.

Table 3 shows the correlation between the physical activity score variables and the MMSE score.

It was identified that all variables present a significant correlation with cognitive deficit from a statistical point of view. There was a positive and moderate correlation (0.488) in the advanced activities score, and a negative (-0.583) and moderate correlation (-0.503) in instrumental and basic activities, respectively.

TABLE 1: Association between sociodemographic variables with cognitive deficit among participating individuals. João Pessoa, PB, Brazil, 2018.

Variables	MEEM		p- value
	Presenting deficit n (%)	No Deficit n (%)	
Gender			
Male	12 (50.0)	12 (50.0)	0.437*
Female	24 (40.7)	35 (59.3)	
Age			
60 to 70 years	8 (57.1)	6 (42.9)	0.966*
> 70 years	39 (56.5)	30 (43.5)	
Education			
Literate	34 (58.6)	24 (41.4)	0.474*
Illiterate	12 (50.0)	12 (50.0)	
Civil status			
Married/living together	4 (66.7)	2 (33.3)	0.693**
Widow/divorced/never married	43 (55.8)	34 (44.2)	
Have/had children			
Yes	24 (53.3)	21 (46.7)	0.510*
No	23 (60.5)	15 (39.5)	
Income			
Up to 1 minimum monthly salary	18 (51.4)	17 (48.6)	0.477**
More than 1 minimum monthly salary	6 (66.7)	3 (33.3)	

Note: * Pearson's chi-squared test; **Fisher's exact test.

TABLE 2: Association between functional capacity and cognitive deficit among older adults. João Pessoa, PB, Brazil, 2018.

Variables	MEEM		p-value
	Present deficit n (%)	No Deficit n (%)	
Advanced activities			
More active	22 (44.9)	27 (55.1)	0.017*
Less active	23 (71.9)	9 (28.1)	
Instrumental activities			
Independent	5 (55.6)	4 (44.4)	0.628**
Dependent	39 (54.9)	32 (45.1)	
Basic activities			
Independent	16 (39.0)	25 (61.0)	0.004*
Dependent	27 (71.1)	11 (28.9)	

Note: * Pearson's chi-squared test; **Fisher's exact test.

TABLE 3: Correlation between the MMSE total score and advanced, instrumental and basic activities of daily living. João Pessoa, PB, Brazil, 2018.

Variables	Total MEEM score	
	Correlation coefficient	p-value*
Advanced activities score	0.488	<0.001
Instrumental activities score	-0.583	<0.001
Basic activities score	-0.503	<0.001

Note: *Pearson's Correlation test

DISCUSSION

The data from the present study indicate that the number of women was higher than that of men in nursing homes, corroborating the findings presented in other studies^{13,14}. However, a smaller number of women had cognitive deficits, which can be explained by the greater concern with health and self-care¹⁵.

The predominance of cognitive deficit among older adult women is in line with other studies¹⁶, which can be explained by the longer female longevity, thus prolonging the exposure to factors of this neuropsychological condition. Another explanation would be that despite having a longer life expectancy, women have a low quality of life, making them more susceptible to this condition¹⁷.

With regard to age group, there was a predominance of cognitive deficit in older adults aged between 60 and 70 years; this is contrary to some studies which defend that older age is configured as a greater possibility of comorbidities in institutionalized older adults^{2,15,18}.

With regard to education, it was seen that most literate individuals had a greater deficit when compared to the illiterate group. This data differs from the result presented in a review study, in which it is revealed that the higher the education level, the lower the cognitive deficit⁶. However, it is necessary to take into account that biological factors can affect cognition, regardless of the subject's education level.

When observing the marital status, the prevalence of institutionalized older adults without a partner was noted. The data also highlight the prevalence of cognitive impairment among childless individuals. The absence of a partner and loneliness can be triggering factors for associated illnesses such as depression¹⁹.

The results for income demonstrate the prevalence of cognitive status with deficit in older adults who earn more than one minimum monthly salary. This finding differs from the result of a survey carried out in a municipality in southern Brazil, which associated low income with a higher probability of cognitive decline¹⁷. However, it is necessary to take into account that the cognitive state is related to the quality of life and that this does not depend exclusively on purchasing power²⁰.

From the analysis of the association between functional capacity and cognitive deficit, it could be noted that there is a lower level of advanced activities among older adults with cognitive decline. AADL are complex activities which involve physical, psychological and social functioning. Difficulty in developing these activities appears throughout aging and is accentuated in old age, characterizing a decline in cognitive capacity⁵.

The IADL demand comes from individual functions which enable autonomy for activities such as preparing meals, managing their own money and dealing with transport. The study data demonstrate the prevalence of independence in these activities by older adults with cognitive deficit, diverging from a study carried out in Pelotas, RS, Brazil²¹.

With regard to basic activities, it was noticed that most research participants with cognitive impairment are dependent. Thus, the association showed statistical significance. The findings suggest that physiological aging leads to deficits in cognitive and motor skills. In turn, the more advanced the chronological age, the greater vulnerability to impairment in functional capacity²². Therefore, it is necessary to reflect that the older adult population that was dependent on basic activities was composed of older adults over 70 years of age.

The present study identified a moderate positive correlation with the MMSE, meaning that the higher the activity level, the greater the cognitive preservation. Performing activities routinely tends to act as a protective factor against cognitive deficit¹⁸.

However, there was a correlation between IADL, BADL and MMSE, indicating a dependence between them in an inversely proportional way. This means that the lower the cognitive capacity, the greater the dependence level in both analyses. One possibility for this would be the deterioration of functional and cognitive abilities that is directly influenced by impairment of the nervous system³.

Therefore, given the transition of the population profile, the importance of researching the functional capacity of older adults and cognitive impairment is highlighted. This study brings data which add an analysis of institutionalized older adults to the literature, enabling more current comparisons.

Study limitations

The study has some limitations, such as a lack of including the assessment of disabling diseases, which can influence the functional loss of older adults and the presentation of cognitive deficit. In addition, as this is a cross-sectional study, the data were analyzed at a specific time, and therefore it would be important for the topic to carry out other studies which seek to carry out an assessment of causality.

CONCLUSION

It was identified that there is a relationship between cognitive deficit and the functional capacity level of institutionalized older adults, so that the deficit is smaller in older adults who are more independent and perform more activities. In addition, it was also possible to identify some factors associated with the deficit: being male, being younger, being literate, having never had or no longer having a partner and not having children.

This study attests to its relevance in analyzing data that demonstrate the functional and cognitive conditions of institutionalized older adults. These results highlight the importance of encouraging assessment of functional and cognitive activities through caregivers and nurses in order to support planning measures to be adopted to prevent diseases. Furthermore, the findings of this study strengthen the literature and encourage further studies.

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