

# Assessment of functional capacity in elderly residents of an outlying area in the hinterland of Bahia/Northeast Brazil

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## ABSTRACT

**Objective:** To assess the functional capacity and to determine the difference between the means of functional capacity (basic and instrumental activities of daily living) and the age groups of elderly residents in an outlying area in the hinterland of Bahia/Northeast of Brazil. **Method:** Analytical study with cross-sectional design and a sample of 150 elderly individuals enrolled in four Health Units in the municipality of Jequié, Bahia, Brazil. The instrument consisted of sociodemographic and health data, the Barthel Index and the Lawton scale. **Results:** In all, 78.00% of the elderly were classified as dependent in the basic activities and 65.33% in the instrumental activities of daily living. Using the Kruskal-Wallis test, we found a statistically significant difference between the means of instrumental activities and the age groups ( $p=0.011$ ). **Conclusion:** An elevated number of elderly were classified as dependent in terms of functional capacity and increased age is related to greater impairment in the execution of instrumental activities of daily living.

**Key words:** elderly, daily activities, social and health conditions.

## Avaliação da capacidade funcional em idosos residentes em área periférica no interior da Bahia/Nordeste do Brasil

## RESUMO

**Objetivo:** Avaliar a capacidade funcional e averiguar a diferença entre as médias da capacidade funcional (atividades básicas e instrumentais de vida diária) e os grupos etários de idosos residentes em áreas periféricas no interior da Bahia/Nordeste do Brasil. **Método:** Pesquisa analítica com delineamento transversal e amostra de 150 idosos, cadastrados em quatro Unidades de Saúde no município de Jequié/BA. O instrumento foi constituído de: dados sociodemográficos e de saúde; Índice de Barthel e Escala de Lawton. **Resultados:** 78,00% dos idosos foram classificados como dependentes nas atividades básicas e 65,33% nas atividades instrumentais de vida diária. Mediante aplicação do teste de Kruskal-Wallis encontrou-se diferença estatística significativa entre as médias das atividades instrumentais e os grupos etários ( $p=0,011$ ). **Conclusão:** Constatou-se elevado número de idosos classificados como dependentes quanto à capacidade funcional e que o aumento da idade está relacionado com um maior comprometimento na realização das atividades instrumentais de vida diária.

**Palavras-chave:** idosos, atividades cotidianas, condições sociais e de saúde.

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The aging population poses one of the greatest challenges to public health, mainly in countries where this phenomenon occurs in situations of poverty and great so-

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cial inequality. The aging world population, which began in developed countries, has shown unprecedented growth levels in underdeveloped countries<sup>1,2</sup>. There are several aging modes in Brazil, according to socioeconomic condition, sex, access to information and education, culture and region where the elderly inhabit. Analysis of each region's profile shows inequalities in the North and Northeast, which are marked by poverty and a life expectancy 10 years lower than that found in the Southeast of the country. Thus, in Brazil, according to the situation and location of the individual, aging and the aging state itself will be affected and will dictate how this person will experience this stage of life<sup>3</sup>. The aging process also has repercussions on health. As individuals age, a higher percentage of chronic non-transmissible diseases emerge and at least one illness or chronic condition is reported by 69% of elderly Brazilians, with a higher proportion in women (75%) than in men (62%)<sup>4</sup>. The aging population and the increased prevalence of chronic diseases have caused a growth in physical and/or mental incapacities among elderly Brazilians, a fact that poses a number of challenges for families and for society, in addition to being a risk to the quality of life of these older individuals. It is estimated that 10% of Brazilians older than 65 years need help with basic self-care activities and that 40% require assistance in the instrumental activities of daily living, accounting for more than 6 million individuals and families<sup>5</sup>. Functional capacity represents the independence of persons in living and performing the physical and mental activities needed to maintain their basic and instrumental activities. These include bathing, dressing, grooming, toilet use, feeding, continence, preparing meals, handling finances, handling medication, housekeeping, shopping, using transportation, using the telephone and walking a certain distance<sup>6</sup>. Impaired functional capacity, besides being the most serious consequence of chronic pathologies in the elderly, affects the psychological status and the use of long-term health care services. Incapacity refers to problems in social functioning and in the performance of normal activities of daily living and to socially defined roles within a particular sociocultural and physical environment<sup>7</sup>.

The inhabitants of outlying areas are the most affected by the lack of health policies and of public and social programs, given that investments in health and welfare areas are irregular and sporadic. Thus, studies of this nature are needed in outlying regions to obtain a clear picture of the health situation of this population. These studies should be aimed at providing the elderly with more integrated care, in addition to creating health programs to minimize dependence in instrumental and basic activities of daily living. As a result these individuals may be able to age with autonomy and independence.

The aim of this study is to assess the degree of func-

tional capacity and determine the difference between the means of functional capacity (basic and instrumental activities of daily living) and the age groups of elderly residents in an outlying area in the hinterland of Bahia/Northeast of Brazil.

## METHOD

This is an analytical study with a cross-sectional design, conducted in the rural community of Jequié, Bahia, in the Northeast of Brazil, between September and November 2008. The sample was composed of 150 elderly individuals, randomly selected by draw with replacements from the health units in the district of Jequeizinho. A total of 10% of the residences containing elderly persons from each of the four health units were included.

This study adhered to the ethical principles contained in the Declaration of Helsinki and in Resolution no. 196/96 of the National Health Council. The research protocols were assessed and approved by the Ethics Committee for Research in Human Beings of the State University of the Southwest of Bahia (protocol no. 189/2008).

The inclusion criteria were: being mentally competent (score above 23 points on the Mini Mental State Examination/MMSE<sup>8</sup>) to respond to the research instrument and agreeing to take part in the study or having participation authorized by the caregiver and signing the informed consent form.

The data collection instrument consisted of two parts. The first part involved sociodemographic characterization (age range, sex, schooling, type of income, income level, marital state and free time activities) and health conditions (health problems and sequelae, type of sequelae). The second part consisted of Barthel's Index<sup>9</sup> and Lawton's Scale<sup>10</sup>, which are used to evaluate functional capacity.

Barthel's Index is composed of 10 items: feeding, bathing, grooming, dressing, bowels, bladder, toilet use, transfers to bed and chair and back, mobility and stairs. The score corresponds to the sum of all the points obtained. Individuals who attain the maximum score of 100 are considered independent and those scoring below 50 points indicate dependence in activities of daily living.

Lawton's Scale encompasses the more complex activities needed for greater social independence, such as: using the telephone, shopping, preparing meals, housekeeping or working in the garden, household repairs, doing the laundry, using transportation, handling medication and managing personal and/or household finances. For each question the first response means independence, the second partial dependence or capacity with help and the third dependence. The maximum score is 27 points. In this study, we adopted the following classification: independence (27 points), partial dependence (26 to 18 points) and total dependence ( $\leq 18$  points).

The data collected were organized into an electronic database using SPSS 13.0 software. Descriptive statistics were used to calculate absolute and relative frequency (categorical variables). The mean and standard deviation (quantitative variables) were also calculated. Inferential statistical analysis was applied using the Kruskal-Wallis test, given that the Kolmogorov-Smirnov test for normality showed that the sample data were not normally distributed. In addition, quartile values were used as reference to define the age groups.

## RESULTS

Of the 150 elderly studied, 68.67% were women, with a mean age of 74.47 ( $\pm 9.42$ ) years, ranging from 60 to 106 years. With respect to schooling level, 61.33% of the elderly were illiterate, 46.67% were married and 33.33% widowed (Table 1).

In regard to profession, 48.70% were farmhands and 24.70% were domestics. Currently 73.33% are retired, 14.67% have no income and 83.33% earn only one minimum monthly wage (R\$ 415.00 $\approx$ US\$ 200.00 Dec 2008). In terms of free time, 78.67% of the elderly reported engaging in no activities during this period.

As to health conditions, 94% reported having health problems, but only 76.70% were taking medication. The most frequent pathologies were hypertension (22.70%), diabetes mellitus (11.30%) and arthrosis (8%). The presence of sequelae was found in only 21.33% of the elderly, the most frequent being neurological (15.30%) (Table 2).

With respect to the basic activities of daily living, 78% of the elderly were classified as dependent, slight dependence being the most frequent (40%) with a mean of 63.17 ( $\pm 29.63$ ) points. The instrumental activities of daily living (65.33%) were classified as dependent, with greater distribution of total dependence and a mean of 19.99 ( $\pm 6.92$ ) points (Table 3).

The Kruskal-Wallis test showed a statistical difference only between instrumental activities of daily living and age groups ( $p=0.011$ ) (Table 4).

## DISCUSSION

Functional limitations can be considered as the process that precedes the condition of incapacity. Identifying the factors related to functional limitations allow the elaboration of public policies aimed at preserving independence in the elderly.

Population studies show a strong association between socioeconomic status and functional limitation in the elderly<sup>5</sup>. In general, a decline in functional conditions is expected with advancing age. Furthermore, individuals with low schooling levels and low income have more functional limitations compared to persons with higher socioeconomic levels<sup>7</sup>. Interventions that may decrease function-

**Table 1.** Distribution of the elderly according to sociodemographic characterization. Jequié/Brazil, 2009.

Sociodemographic characteristics	n	%
Sex		
Female	103	68.67
Male	47	31.33
Schooling		
Illiterate	92	61.33
Literate	58	38.67
Marital status		
Married/Common law	70	46.67
Single	15	10.00
Widowed	50	33.33
Separated/estranged/divorced	15	10.00
Free time activities		
None	118	78.67
Takes care of the house	17	11.33
Watches TV + listens to radio	8	5.33
Works	5	3.33
Church + TV	2	1.33
Type of income		
Retirement pension	110	73.33
Other pension	15	10.00
Retirement and other pension	2	1.33
No income	22	14.67
Total	150	100

**Table 2.** Distribution of the elderly according to health conditions. Jequié/Brazil, 2009.

Health conditions	n	%
Health problems		
Yes	141	94.00
No	9	6.00
Presence of sequelae		
Yes	32	21.33
No	118	78.67
Total	150	100

**Table 3.** Distribution of the elderly according to degree of dependence in functional capacity. Jequié/BA, Brazil 2009.

Functional capacity	n	%
Basic activities of daily living		
Independent	33	22.00
Dependent	117	78.00
Slight dependence ( $\geq 60$ Points)	60	40.00
Moderate dependence (55-20 Points)	34	22.67
Dependent ( $< 20$ Points)	23	15.33
Instrumental activities of daily living		
Independent	52	34.67
Dependent	98	65.33
Partial dependence (26-18 points)	48	32.00
Total dependence ( $\leq 18$ points)	50	33.33
Total	150	100

**Table 4.** Distribution of the means of functional capacity (basic and instrumental activities of daily living) according to the age groups. Jequié/BA, Brazil, 2009.

	Age group	n	Mean rank	p-value
Activities of daily living	≤ 70 years	52	73.44	0.872
	71-77 years	49	75.26	
	>77 years	49	77.93	
Instrumental activities of daily living	≤ 70 years <sup>a</sup>	52	85.81	0.011*
	71-77 years <sup>a</sup>	49	78.98	
	>77 years <sup>b</sup>	49	61.08	
Total		150		

\*Statistically significant difference.

al capacity impairment in the elderly population must be explored to develop new prevention and treatment strategies that reduce functional consequences, specifically in low-income elderly, since they are more predisposed to functional capacity impairment than are the general population.

The sociodemographic characteristics of the subjects in this study corroborate those found in the literature in terms of prevalence in women (68.67%), married individuals (46.67%), low income (83.33%) and schooling level (61.33% illiterate). These data reveal that the elderly residents of outlying areas have a lower socioeconomic level, more compromised health, more physical and mental morbidity and serious social demands.

According to the demographic census of 2000, 55.1% of elderly Brazilians were women, 51.85% were married and 28.50% were widowed. The access to schooling for this group was less than that of the general population. The income of these individuals was lower than the national average, in which 27.4% earn one minimum monthly wage<sup>11</sup>.

With respect to health conditions, hypertension was the most frequently reported chronic disorder, confirming observations from earlier investigations on elderly populations. In a study conducted in Minas Gerais, hypertension prevalence of 37% was found for men and 50% for women<sup>12</sup>.

Maintaining and preserving the functional capacity of the elderly to perform the basic and instrumental activities of daily living are fundamental points for prolonging their independence for as long as possible and maintaining their functional capacity<sup>13</sup>.

The present study found a high degree of incapacity in the elderly assessed (78% in the ADLs and 65.33% in the BADLs). Population studies show that around 40% of the elderly aged 65 years or older need some type of help to perform their activities of daily living, such as handling finances, preparing meals and housekeeping and a lower significant portion of 10% require help to perform basic tasks, such as bathing, dressing, going to the bathroom, feeding and transferring to chairs and beds and back<sup>14</sup>.

Of the adults between 65 and 75 years of age, 5.3%

need assistance to perform basic daily activities (bathing, dressing, walking, using the toilet and transferring from the bed to a chair). A little less than 6% need help in daily activities (cooking, shopping, using the telephone, domestic chores and handling personal finances). At 85 years of age, these indices increase dramatically to 35% and 40% respectively<sup>15</sup>.

In the present study it was found that most elderly (40%) exhibited slight dependence in the ADLs, that is, impairment in at least two of the Barthel Index activities. This may be explained by the fact that because the mean age of the elderly was 74 years, impaired functional capacity was still in the early stages. These data are corroborated in the Brazilian literature and in other countries, which affirm that each year around 10% of adults over the age of 75 years lose their independence in one or more basic activities of daily living, such as: bathing, dressing, feeding and grooming<sup>16</sup>.

Results of a study conducted in São Paulo show that more than half of the population (53%) reported needing partial or total help to perform at least one of the activities of daily living. It was also found that 29% of the elderly needed partial or total help to perform up to three of these activities and 17% needed help to perform four or more activities of daily living<sup>17</sup>.

In regard to the capacity to perform the BADLs, it was detected that 33.33% of the elderly displayed total dependence. These data contradict the results found in a study carried out in Goiania, Brazil, in which 68.4% of the elderly showed slight dependence and only 4.2% total dependence<sup>18</sup>.

The present study showed that increased aging is related to greater impairment in the capacity to execute instrumental activities of daily living. In general, a decline in the capacity to perform instrumental activities of daily living is expected with increased chronological age. Individuals in the older age groups exhibited higher prevalence of functional incapacity. Functional limitations are usually more frequent in older individuals because of their longevity<sup>7</sup>.

Given that the functional capacity of a human being declines with age, strategies that improve the lifestyle of the elderly of this region are needed, mainly with respect to programs that promote the following: improvement of muscle and joint strength; treatment and rehabilitation of the functional capacity of urinary and bowel sphincters; social integration in and out of the family context; construction of an adequate elderly support system; permanent education over their entire lifetime and recognition of the individual and population aging process. These measures might minimize functional dependence and result in an aging process with autonomy and better quality of life for the elderly.

It should be emphasized that the results of the present study cannot be generalized for the entire population of the Bahia hinterland, given that the sample studied was homogeneous in terms of sociodemographic aspects. Moreover, this study describes the specific situation of elderly individuals living in the outlying area of a city in the hinterland of Northeast Brazil. Hence, new studies are fundamental for drawing the functional profile of elderly residents in other outlying areas to provide information that could help in developing programs and interventions in the field of elderly health.

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