

Temporal analysis of the functional status of older people in the state of Paraíba, Brazil

Análise temporal do estado funcional de idosos do estado da Paraíba
Análisis temporal del estado funcional de ancianos del estado de Paraíba, Brasil

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ABSTRACT

Objective: To verify the profile and the functional status of older people living in the state of Paraíba, Brazil, from a temporal perspective. **Method:** This was a descriptive study with secondary analysis of data from the Health Indicator and Aging Policy Monitoring system (SISAP-Idoso – *Sistema de Indicadores de Saúde e Acompanhamento de Políticas do Idoso*) between 2000 and 2010. **Results:** Over the analyzed period, there was a growth of older women, people older than 85 years, residents of urban areas, older people who live alone and who are not responsible for the household. There was also a decrease of illiterate older people, with monthly income of up to one minimum wage and in poverty situations. Concerning the functional status, the proportion of older people who reported any permanent mental, motor, visual or hearing disabilities has increased. **Conclusion:** We suggest that the assistance must be directed towards environmental variables that can influence the functional state, such as illiteracy, low income and disabilities that contribute to the weakening of older people and must be overcome.

Descriptors: Aged; Risk Factors; Health of the Elderly; Physical Fitness; Temporal Distribution.

RESUMO

Objetivo: verificar o perfil e o estado funcional de idosos residentes no estado da Paraíba, em uma perspectiva temporal. **Método:** estudo descritivo, com análise secundária de dados do Sistema de Indicadores de Saúde e Acompanhamento de Políticas do Idoso, entre os anos de 2000 e 2010. **Resultados:** neste período, houve um crescimento de mulheres idosas; de pessoas com idade entre 85 anos ou mais; residentes em áreas urbanas; idosos que moram sozinhos e que não são responsáveis pelos domicílios. Verificou-se também diminuição de idosos analfabetos, com rendimento mensal de até um salário mínimo e em situação de pobreza. Em relação ao estado funcional, aumentou a proporção de idosos que declararam ter alguma deficiência mental permanente, motora, visual ou auditiva. **Conclusão:** Sugere-se que as intervenções de saúde sejam direcionadas para variáveis ambientais que favoreçam um bom estado funcional, como analfabetismo, baixa renda e incapacidades, que contribuem para a fragilização do idoso e precisam ser superadas.

Descritores: Idoso; Fatores de Risco; Saúde do Idoso; Aptidão Física; Distribuição Temporal.

RESUMEN

Objetivo: verificar el perfil y el estado funcional de ancianos residentes en el estado de Paraíba, Brasil, en una perspectiva temporal. **Método:** estudio descriptivo con análisis secundario de datos del Sistema de Indicadores de Salud y Seguimiento de Políticas del Anciano, entre los años de 2000 y 2010. **Resultados:** en este período se identificó crecimiento de mujeres ancianas; personas con edad entre 85 años o más; residentes en áreas urbanas; ancianos que viven solos y que no son responsables por los domicilios. Se verificó también reducción de ancianos analfabetos, con rendimiento mensual de hasta un salario mínimo y en situación de pobreza. En relación al estado funcional, la proporción de ancianos que declararon alguna

deficiência mental permanente, motora, visual o auditiva apresentou aumento. **Conclusión:** Se sugiere que las intervenciones de salud sean direccionadas para variables ambientales que favorecen un buen estado funcional, como analfabetismo, baja renda y discapacidades, que contribuyen para el debilitamiento del anciano y necesitan ser superadas.

Descripciones: Anciano; Factores de Riesgo; Salud del Anciano; Aptitud Física; Distribución Temporal.

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INTRODUCTION

The growing population of older people worldwide makes chronic disease management and the improvement of life of this age group new challenges to global public health. However, for the United Nations (UN), older people differ in developed and developing countries, according to the context and the conditions of each region, regarding the establishment of public policies⁽¹⁻²⁾.

In Brazil, the population aging has occurred rapidly in recent years, as a result of the demographic development. In the 1940s, older people accounted for 4.1% of the total Brazilian population and, in 2011, amounted to 20.5 million, equivalent to 10.8% of the total. By 2020, older people are expected to be around 30.9 million, about 14% of the total population, which puts Brazil in the sixth place in the world classification⁽³⁾.

With advancing age there are morphological, functional and biological changes that trigger the progressive loss of the individual's ability to adapt to the environment and cause greater fragility and decreased functional capacity as well as the potential for performing personal care, basic and more complex everyday life activities⁽⁴⁾.

Functional capacity can be defined as "a construct that indicates the maximum amount of functionality that a person can achieve in a given moment." Studies show that this issue is a new paradigm on old people's health, being autonomy one of the main factors considered regarding health policies – namely, the ability to choose for themselves as a result of the relationship between physical and mental health, functional independence, social integration, family support and financial self-sufficiency⁽⁵⁾.

However, in urban areas, especially in peripheral regions, many problems can negatively affect the well-being of a person, including, for example, poverty, illiteracy, overcrowding and poor sanitation. Thus, old people are more vulnerable to these difficulties and, consequently, to numerous noncommunicable diseases and their complications because of the absence of basic facilities, precarious health services and stress due to the lack of social support⁽⁶⁻⁷⁾.

OBJECTIVE

This study aimed to verify the socioeconomic profile and functional status of older people living in the state of Paraíba, Brazil, from a temporal perspective. Results will allow to rethink the current intervention strategies, aiming to delay the losses caused by the aging process and the potential diseases associated with it.

METHOD

Ethical aspects

This research showed no need for approval by a Research Ethics Committee since it did not fit the definition of "research involving humans," as per the Resolution 466/12 guidelines, considering that it deals with free access data.

Study design, place and period

This was a descriptive study based on secondary analysis of data available in the Health Indicator and Aging Monitoring Policies system (SISAP-Idoso – *Sistema de Indicadores de Saúde e Acompanhamento de Políticas do Idoso*), a Oswaldo Cruz Foundation database, from 2000 to 2010, in the state of Paraíba, Brazil. The time frame refers to the period in which the studies were available in the system. Located in the Northeast region of the country, the state of Paraíba has 233 cities and an agriculture-based economy. In 2010, Paraíba had 3,766,528 inhabitants, of which 12% were over 60 years⁽⁸⁾.

Sample and inclusion and exclusion criteria

The sample comprised people with 60 years of age or older and registered in various health information systems. SISAP-Idoso was developed to provide a management tool for the Unified Health System (SUS) that allows to know both the health situation of old people and to establish continuous monitoring processes based on health indicators. The system gathers information from different sources, researches and investigations. To produce these indicators, data from the Outpatient Information System of the Unified Health System (SIA/SUS – *Sistema de Informações Ambulatoriais*), Mortality Information System (SIM/SUS – *Sistema de Informações de Mortalidade*), Immunization Information System (SI-PNI – *Sistema de Informações do Programa Nacional de Imunizações*) and Hospital Information System of SUS (SIH/SUS – *Sistema de Informações Hospitalares*) are used⁽⁹⁾.

Research and surveys used in SISAP-Idoso are selected according to two criteria: (1) they must be representative of the population and (2) they must be able to be disaggregated and characteristic of people with 60 years of age or older. Hence, the National Household Sample Survey (PNAD – *Pesquisa Nacional por Amostra de Domicílios*), the National Health Survey (PNS – *Pesquisa Nacional de Saúde*), and the VIGITEL were included. Demographic information was obtained through demographic censuses carried out by the Brazilian Institute of Geography and Statistics (IBGE)⁽⁹⁾.

Study protocol

In recent decades, the interest in using databases for information on health and as a tool in policy-making, planning

and service management has increased in Brazil. Thus, this thematic field has been structured in an interdisciplinary and strategic way regarding the use of generated knowledge and its effects on users' activities⁽¹⁰⁾.

In this study, we collected secondary data from the state of Paraíba in the Conceptual Matrix by Health Dimensions section of the SISAP-Idoso, a public domain database with unrestricted access through the Internet. Each indicator was grouped by dimension in its conceptual matrix and, among them, some were selected as relevant to the monitoring of health policies and programs⁽⁹⁾.

The Conceptual Matrix by Health Dimensions of the SISAP-Idoso was built based on the Health System Performance Evaluation project (PROADESS – *Projeto Avaliação do Desempenho do Sistema de Saúde*) and adapted to the specific conditions of older people's health. While in the PROADESS the matrix serves for the assessment of the health system, in SISAP-Idoso it assists in the diagnosis of the old people's health⁽⁹⁾. For creating PROADESS, indicators were consulted via TABWIN in the databases of national health systems. Through the database of the Institute of Applied Economic Research (IPEADATA – *Instituto de Pesquisa Econômica Aplicada*) it was possible to access the data already processed regarding socioeconomic characteristics. The information system of the National Register of Health Service Providers (CNES – *Cadastro Nacional de Estabelecimentos de Saúde*) has also been used to describe the health network structure⁽¹¹⁾.

For this study, in the "Health determinants and risk factors" dimension, in the socioeconomic and social fragility indicators, the following variables were defined: illiterate old people, old people with nominal monthly income of up to one minimum wage, old people in poverty, old people living alone and old people who are not responsible for the household; in the demographic indicators, we determined as variables old people living in urban areas, total of old people population, proportion of people aged 85 years or older. In the "Health conditions of older people" dimension, in the functional status indicators, we selected as variables old people with mental disabilities, old people with motor disabilities, old people with visual impairments, and old people with hearing impairments. Data collection occurred in November 2016 and we used a structured observation script with the variables.

Analysis of results and statistics

For the data analysis we used the descriptive statistics (proportion), conducted on the Microsoft® Office® Excel 2007 software. Then the results were organized in tables.

RESULTS

Between 2000 and 2010, the total older people population in the state of Paraíba increased from 10.17% to 11.98%. Analyzing some of the main determinants and risk factors for functional incapacity, we noted a growth of older women, people aged 85 years or older, older people who live in urban areas, alone and who are not responsible for the household (Table 1). The research considers the household responsible concept

used by IBGE, based on the answer of the residents regarding the person responsible for maintaining the household (or the family).

Regarding the socioeconomic profile over the considered time, there was also a decrease of illiterate older people, with monthly income of up to one minimum wage and in poverty.

Regarding functional state, between 2000 and 2010, the older people's health conditions worsened in the state of Paraíba, due to an increase in the proportion of those who reported any permanent mental disability, motor (completely unable, with small or major difficulty walking or climbing stairs), visual or hearing impairments (Table 2). These indicators influence the ability of older people to perform daily activities. When associated with conditions of lesser physical agility and performance, this shortfall in capacity can be a big risk factor for isolation, loss of motivation and lack of interest in the participation of social life.

Table 1 – Health determinants and risk factors of older people in the state of Paraíba, Brazil, between 2000 and 2010

Indicators/Years	2000	2010
Older women	10.98%	13.16%
People aged 85 years or older	7.06%	8.53%
Residents in urban area	69.87%	73.84%
Illiterate	56.52%	48.27%
Monthly income of up to one minimum wage	72.45%	70.55%
Poverty	29.54%	25.60%
Live alone	9.67%	11.27%
Not responsible for the household	13.95%	15.02%

Source: SISAP-Idoso (2016).

Table 2 – Functional status of older people in the state of Paraíba, Brazil, between 2000 and 2010

Indicators/Years	2000	2010
Mental disability	61.44%	68.91%
Motor impairment	33.26%	37.76%
Visual impairment	45.15%	52.58%
Hearing impairment	22.31%	23.88%

Source: SISAP-Idoso (2016).

Table 3 shows data related to the functional state of the investigated age group. We should point out that the year evaluated was 2013, the only one available in SISAP-Idoso, concerning basic and instrumental activities of daily living. Thus, 7.86% of the older people considered reported inability or great difficulty in: (1) eating alone with a plate placed before them, which involves holding a fork, cutting food and drinking from a glass; (2) showering alone, including going in and out of the shower or tub; or (3) going to the bathroom alone, as well as sitting down and lifting the toilet. Furthermore, 11.22% of older people reported not being able or having great difficulty in walking alone around the house, from one room to another.

Table 3 – Functional status of older people in the state of Paraíba, Brazil, between 2013 and 2010

Indicators/Years	2013
Having difficulty, because of health problems, to eat, take a shower or go to the bathroom	7.86%
Having difficulty to walk home alone	11.22%
Having functional impairment to perform Activities of daily living (ADLs)	10.24%
Having functional impairment to perform Instrumental Activities of Daily Living (IADLs)	25.96%

Source: SISAP-Idoso (2016).

Regarding the Activities of Daily Living (ADLs), 10.24% reported inability or great difficulty to perform at least one of the following activities: (1) eating, (2) showering and (3) going to the bathroom alone; (4) dressing alone, including putting on socks and shoes, zipping up and opening and closing buttons; (5) walking around the house alone; (6) getting in or out of bed alone. Moreover, 25.96% pointed out inability or great difficulty to perform at least one of the following Instrumental Activities of Daily Living (IADLs): (1) shopping alone, i.e., for food, clothing or medicines; (2) managing finances alone (taking care of their own money); (3) taking their medication alone; (4) going out alone and using buses, subway, taxi, car, etc.

DISCUSSION

The proportion of older women has increased between 2000 and 2010. The feminization of old age is related to the increased survival of women when compared to men, since they take better care of themselves and easily adapt to new functions⁽¹²⁾.

Concerning functionality, women have a higher level of disability than men. Female old age is associated with a higher prevalence of chronic diseases. In short, older women have a lower socioeconomic condition than men, because many did not attend school and did not have formal jobs⁽¹³⁾.

People aged 85 years or older also grew in number in the investigated interval. It is known that the advance of age is considered one of the most important risk factors for the deterioration of the functional capacity because of the increase in physiological changes (sensory, neurological and musculoskeletal systems) and the prevalence of chronic diseases⁽¹⁴⁾.

A possible explanation for the increase of older people living in urban areas could be the need for more frequent medical care in this age group. In addition, in the event of widowhood, older people often take to reside with their descendants (children and grandchildren) for greater security and quality of life⁽¹⁵⁾.

Thus, the growing transition of older people from rural to urban areas can be explained because of the search for better conditions of access and use of health care services and new sources of income. After all, because of the precarious conditions of life and the lack of opportunities in the countryside, it is possible that these old people have been deprived of schools and health care, which highlights the need for an integral attention to prevention and maintenance of their functionality⁽¹⁶⁻¹⁷⁾.

In the state of Paraíba, despite the decrease of the levels of illiteracy among older people between 2000 and 2010, monthly income below one minimum wage and poverty rates remain

high. Over recent decades, Brazilian educational alternatives were imposed for the “out-of-school” population, as the Youth and Adults Education (EJA – *Educação de Jovens e Adultos*) and Literate Brazil Program (PBA – *Programa Brasil Alfabetizado*), aimed at youth, adults and older people literacy, especially in municipalities with illiteracy rates higher than 25% – 90% of them located in the Northeastern Region of the country. However, despite national efforts, the problem persists⁽¹⁸⁻¹⁹⁾.

Low levels of education and income are distinctive of this generation of older Brazilians, who had restricted access to education and, therefore, few job opportunities⁽²⁰⁾. This negatively affects their health aspects by making them more vulnerable to diseases, in addition to poor life conditions, lack of basic sanitation, poor access to health care services, consumer goods, healthy nutrition and adequate housing, which creates greater social inequality that culminates in the decrease of life quality and difficulties for self-care⁽²¹⁻²²⁾.

A research conducted in the city of Montes Claros (MG) showed that older people with fewer years of schooling and monthly income of up to two minimum wages showed higher percentage of inadequate functional capacity. The low *per capita* income of this age group, associated with low schooling, causes them to be deprived of adequate health care as well as purchasing medicines or paying health care plans, with direct repercussions on their functional performance, since income is an essential element to preserve the autonomy and maintenance or recovery of health⁽²³⁾.

Differences in results – increase in the number of old people who live alone and decrease of those not responsible for the household – can be explained by the double relation of age with household arrangement. The years can cause older people to stay alone because of the loss of a spouse, but also increases the chances of living with relatives because of greater physical dependence. A higher percentage of older adults who live alone shows, on the one hand, that they have successfully experienced the aging process. On the other hand, it is a concerning matter, as they may find some impasses when using health services as well as hardships in performing everyday tasks, which can be aggravated by the absence of a family member⁽²⁴⁾.

Regarding health conditions, visual and hearing capabilities are key aspects of functioning among old people. Therefore, the increase of these disabilities tends to compromise the performance of ADLs by creating greater dependency. Vision and hearing problems are risk factors for falls, depressive symptoms, reduced health-related quality of life and are directly related to aging and chronic diseases as they directly affect the functional capacity and mobility of older people⁽²⁵⁾.

Since most sensory deficiencies belong to the old population, they hinder the rehabilitation process. Factors such as low pay and living alone play an important role, since the living conditions of these people are determined by variables such as marital and health status, financial dependency, family relationships and social support⁽²⁶⁾.

In the studied period, the growth of mental illnesses should also be noted. In Brazil, the relative increase of the old people population contributed to change the profile of morbidity and mortality, which results in the higher prevalence of chronic-degenerative and disabling diseases such as those related to cognitive decline, with higher incidence of Alzheimer's disease (AD). Cognitive losses are more frequent in women – because of a higher disposition for AD and longer life expectancy – and in individuals with low education levels, who are not physically active, who have low economic conditions, and who are older and frail. Other risk factors such as chronic diseases (hypertension, diabetes mellitus, among others), depression and the institutionalization status increase the exposure to cognitive losses. In short, these are all variables to which preventive actions can be taken⁽²⁷⁻²⁸⁾.

Among them, we highlight the level of education, which is inversely proportional to cognitive losses. Schooling leads the individual to improve basic knowledge in search of diversification of activities and intellectualization, which, in turn, enhances their performance in tests of cognitive abilities during old age⁽²⁷⁾.

There was a higher frequency of functional impairment to perform IADLs (25.96%) than basic ADLs (10.24%) in 2013. Hierarchically, losses occur from IADLs to basic ADLs because IADLs require greater cognitive and physical integrity when compared to basic ADLs⁽⁴⁾, which raises the chance that this difference is also associated with the increase in mental and motor impairment among the old people of Paraíba in the 2000-2010 period.

Another point that also supports this hypothesis is that IADLs connect community and residence. Thus, the lack of schooling, which is high in this population and its consequent low purchasing power can influence buying options, finance control and other IADLs⁽²⁹⁾.

However, this hierarchy in functional decline with subsequent loss to independently perform basic ADLs reflects more dependency. In this case, it is a responsibility to be shared between older people, caregivers and professionals through coordinated and continuous care to provide the basic conditions for a suitable performance⁽³⁰⁾.

Maintaining functional capacity has important implications for the quality of life of older people, since it involves working until more advanced ages. Therefore, is essential to plan specific intervention programs to eliminate risk factors related to the loss of autonomy and independence – with emphasis on visual problems, hypertension and mental illness, variables that can be acted upon. Such a program must permeate activities that stimulate social and healthy living in groups, with recreational, cultural and physical pastimes⁽³¹⁾.

Aging populations have more chronic diseases and disabilities, which strongly reflect in the increased demand for health care and impose challenges such as reducing inequalities.

After all, poorer old people have lower access to health care plans and require more attention, yet rarely use health services, which ultimately worsens social inequality. There is some endogeneity in the equation of individuals' income, i.e., worst income generates poorer health, and worse health, lower income. That is why public health care policies are also policies to combat poverty and inequality⁽³²⁾.

Over the last three decades, poverty rates in Brazil dropped by more than five times. Between 1991 and 2008, the Gini coefficient fell 15%, although it remains one of the largest in the world (0.54 in 2009). Policies to reduce inequality have shown the way to reduce poverty, largely represented by income transfer programs (mainly the Bolsa Família), the minimum wage policy and the expansion of the non-contributory social security system⁽³³⁻³⁴⁾.

However, social inequalities regarding the health of old Brazilians are still noteworthy. Those whose household income *per capita* lies in the bottom quintile have worse health perception, functional capacity and attend fewer medical appointments. In a study conducted on social health inequalities among old Brazilians (1998-2008), there were no changes in the magnitude of disparities by income in their self-assessment of health and functional capacity⁽³³⁾.

In this case, differences by income in the current functional capacity of older people can be explained by factors related to health services, since, despite obvious improvements, there are still differences when using services, in addition to the underfunding of the Brazilian health system⁽³³⁾.

Limitations of the study

This study has the typical limitations of a research that uses secondary sources, such as data extraction and analysis, which restrict its use by researchers and/or health professionals. There is also the fact that we did not identify the functional state on a national scope, which would allow comparisons with regional specificities.

Contributions to the area of nursing and public health

Results suggest the need for partnerships between health professionals, older people and their relatives and social organizations aimed at the promotion of aspects that interfere in the functional capacity of this age group, as physical activities, healthy eating, social support networks, access to health care services and information about their rights – namely, measures to act on the three levels of health prevention and, therefore, promote an aging process with independence, autonomy and quality of life.

CONCLUSION

The use of temporal analysis allowed us to register the evolution of phenomena and identify trends that converge to indicators such as women, and, among them, being 85 years of age or older, living alone, increase of disabilities and impairments, and decrease of poverty and illiteracy. Thus, the study suggests that the actions to be taken should not be directed only to the functional state. Actual effective measures need to be directed towards higher levels of this matrix, aiming at a good functional

state and thus interfering with the determinants of environmental change, such as illiteracy, low income and disabilities, which can become risk factors and need to be overcome.

Results show the need to take actions to monitor and control factors that interfere with functional capacity. For the

nursing field, it is relevant to identify the performance of older people during basic and instrumental activities of daily living, since the results can help rethinking intervention strategies used in the services to delay the losses caused by the aging process and possible diseases.

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