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Factors determining the negative perception of the health of Brazilian elderly people

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Abstract

Objective: To identify factors that determine the negative perception of the health of the Brazilian elderly, considering sociodemographic conditions, functional limitations and illness, patterns of utilization of health services and oral health condition. *Method*: A cross-sectional study with data from the National Health Survey (2013), involving 23,815 elderly persons was carried out. Once the database was treated, dimensionality reduction was performed using the Waikato Environment for Knowledge Analysis. The variables related to health perception were evaluated through logistic regression to measure the magnitude of the associations. Health perception and 36 independent variables were considered as outcome variables. *Results*: The variables most strongly related to the negative perception of the health of the elderly were illiteracy (OR=1.48), low educational level, total difficulty in performing instrumental activities of daily living (OR=2.04), impossibility of performing any activity (OR=3.20), presence of a diagnosis of physical or mental illness (OR=2.44), negative self-perception of oral health (OR=1.92), an increased need for health services in recent weeks (OR=1.16), medical visits and hospitalization in the last 12 months (OR=1.40). *Conclusion*: The use of multidimensional methodologies can identify the influence of determinants of a negative perception of health among Brazilian elderly persons, and can support the formulation of public health policies aimed at the elderly population.

Keywords: Self Concept. Self-Assessment. Health of the Elderly. Perception.

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INTRODUCTION

A reversal in the global aging pyramid is currently underway, resulting in an increase in life expectancy and a reduction in birth rates, a process that is more intense in developing countries. The exponential increase in individuals aged 60 years or older, considered elderly, has resulted in a number of concerns and challenges for global health services[1-3]. It is projected that around 33.7% of the total population of Brazil will be considered elderly by 2060[4].

Reaching the age of 60 and over has become accessible to different social classes. At the same time, literature reveals that being elderly is associated with a loss of functional capacity in a natural, gradual and progressive manner, with this process intensified by the presence of diseases and other situations. The profile resulting from limitations and coerced partial or total dependence in the performance of basic or instrumental activities of daily living influences the individual's perception of their own health, and is comprised of a vast group of aspects important for quality of life, many of which remain unknown and which can precede profiles of functional weakness[3,5,6].

Health surveys that draw on cultural plurality and the different social realities at national and global levels represent a solid source of information. The Pesquisa Nacional de Saúde (PNS) (National Health Survey) was a household-based survey which aimed to describe the panorama of the health situation in terms of the care, access to and use of health resources of the entire Brazilian population. It also sought to identify other aspects such as lifestyle, perception of health, and the resources provided in the field of care[6-9].

The PNS allowed the identification of aspects that directly contribute to the perception of health of the elderly individual. Such information is essential and represents a basis for planning and projections in the field of health. The perception of health is based on the complete range of factors perceived by an individual regarding their true state of health, has multidimensional influence and expresses objective and subjective aspects[10-12]. A positive perception of one's health condition is essential among elderly persons so that they can live in a balanced manner and continue to interact with their families and society[6].

While much literature is available on the perceived health condition of the elderly, studies that consider small population groups in relation to a specific health situation or service predominate[6,10,13-16]. Surveys that evaluate wider influences on the negative perception of health of the elderly, through national-based surveys, were not found, despite the need to consider this data source due to its magnitude and scope and potential use as a benchmark for policy planning and health actions[6,7,10-12].

In this context, the aim of the present study was to identify the factors that determine the negative perception of the health of Brazilian elderly persons, considering socio-demographic conditions, functional limitations and illness, the pattern of health service use and oral health conditions.

METHOD

A cross-sectional, quantitative study was carried out with data from the population-based survey (PNS) proposed by the Ministry of Health and conducted in 2013 by the Brazilian Institute of Geography and Statistics (IBGE)[17].

The study was carried out at a household level and the sampling plan used was based on probabilistic sampling by clusters in three stages, with census tract sectors or groups used as the primary sampling units, households as the secondary units and the selected elderly inhabitants taken as the tertiary units[8,9,17].

The sample size was defined based on the level of precision required to estimate some of the indicators of interest. As a result, the information of 205,546 individuals residing in 60,900 households was acquired[8,9,17]. Details on the sampling and weighting process are available in the PNS report[17].

The data were collected by previously calibrated researchers. The information was obtained through individual interviews and stored on handheld computers. Individuals aged older than 18 years participated in the research. The interview was based on three forms: the household form, referring to

the characteristics of the household; a form relating to all the residents of the home; and an individual form, answered by a resident of the household aged 18 years or older selected by random draw[8,9,17]. The present study considered only the data of individuals aged over 60 years, taken from the last two forms (N= 23,815).

The national survey was approved by the National Commission of Ethics in Research for Humans of the Ministry of Health, under approval N° 328.159, dated June 26, 2013.

The outcome variable *Perception of health* was the result of the question: *In general, how is your overall state of health*? The answers were: *very good, good, regular, poor* and *very poor*. For the purpose of analysis, the responses were grouped into positive (response patterns: *very good* and *good*) and negative (response patterns: *regular, poor* and *very poor*) categories[10,14]. This question was answered by a single resident for all the members of the household and, therefore, was not answered specifically by the elderly.

In the pre-exploration phase of the data, 36 variables of interest were included to compose the independent variables related to: sociodemographic characteristics; functional limitations and illness; use of health services, hospitalizations and medical emergencies; and oral health status (Chart 1). All the variables were treated. The numerical variables were categorized, some variables were recategorized, and others were dichotomized in accordance with literature[18].

For the purposes of this study, the variable *Total Difficulty in Performing Basic Activities of Daily Living* (BADL) was developed through a combination of the variables: difficulty eating alone with a dish placed in front of the individual; difficulty in bathing alone; difficulty going to the bathroom alone; difficulty in dressing alone; difficulty walking from one room to another in the house; difficulty in lying down or getting out of bed alone; difficulty sitting or standing up alone. *Total Difficulty in Performing Instrumental Activities of Daily Living* (IADL) came from the questions: difficulty shopping alone; difficulty managing finances alone; difficulty taking medicines alone; difficulty going to the doctor alone; difficulty going out in the car alone, and difficulty managing finances alone (taking care of one's own money). The variables were dichotomized in terms of difficulty, covering the response patterns: *cannot, great difficulty, little difficulty* and *without difficulty*, based on the response pattern *no difficulty*. Functional difficulty for BADL and IADL were defined in the same way: difficulty, regardless of the degree, for all the activities of daily living investigated, based on similar studies in literature[5,12,18].

Following the complete treatment of the database, the dimensionality reduction test was performed. For this, the Selecting Attributes method was applied based on the filter approach using a Data Mining environment, namely the Waikato Environment for Knowledge Analysis (WEKA). This approach used the Correlation-based Feature Selection (CFS)[19] algorithm in tandem with the 10-fold cross validation. This test analyzes all the variables included in the analysis at the same time and identifies which are the independent variables, with a heightened relationship with the dependent variable and a low relationship between each other, eliminating any confounding relationships. The final model considered only the variables with great potential for explaining the outcome variable, which allowed the validation of the pure and strict relationships between the independent variables and the outcome variable, with much more precision than other tests frequently used in literature. In addition, the models generated in this way provide greater explanatory capacity and hit rate, as well as the extraction of potentially useful and previously unknown knowledge in a large database[19], as was the case in the present analysis.

The variables related to perception of health were then evaluated through logistic regression to measure the magnitude of the associations. The model had an explanatory capacity of 68.76%. All analyzes were performed in the WEKA environment[19].

Chart 1. Description of independent variables used in the study. PNS, Brazil, 2013.

Sociodemographic characteristics	
Gender	Literacy
Age	Level of schooling
Skin color/ethnicity	Income
Lives with partner	Region of residence
Marital status	
Functional limitations and illness	
Presence of any chronic, physical or mental illness	Was bedridden
The presence of chronic illness, physical or mental, which somehow limits usual activities	Number of days bedridden
Stopped performing any of usual health activities	Total difficulty in performing Basic Activities of Daily Living
Number of days stopped doing usual activities for health reasons	Total difficulty in performing Instrumental Activities of Daily Living
Use of health services	
Location where usually seeks care when sick	Reason for seeking health care
Time since last medical appointment	Location where last sought health care
Number of visits in last year	Had drugs prescribed at last visit
Seek a place, service or health professional for care related to own health in the last two weeks	Used some integrative or complementary practice or treatment such as acupuncture, homeopathy, medicinal plants or phytotherapy
Hospitals and medical emergencies	
Hospitalizations in the last year	Length of hospital stay
Number of hospitalizations in the last year	Emergency care at home
Reason for hospitalization	
Oral health condition	
Perception of oral health	Upper dental loss
Difficulty eating	Number of natural teeth present
Lower dental loss	Use of dentures

RESULTS

Attribute selection analysis revealed that the variables most strongly related to health perception among Brazilian elderly persons were: literacy (100%); level of schooling (100%); impossibility of performing any usual activities due to health reasons (100%); diagnosis of any chronic, physical or mental illness (100%); seeking a place, service or health professional for care related to one's own health in the last two weeks (100%); number of visits to the doctor in the previous 12 months (100%); hospitalization in the previous 12 months (100%); difficulty in performing IADL (100%) and perception of oral health (80%). According to the methodological proposal, only these variables were considered for the present analysis.

The descriptive analysis of variables strongly associated with the health perception of the elderly can be seen in Table 1 and the odds ratios for reporting negative health perceptions in Table 2. This negative evaluation was present in 56% of the elderly persons who comprised the study sample.

The majority of the elderly persons (76%) were literate, with a low level of schooling. It was found that the lower the educational level, the greater the chances of having a negative perception of health. A total of 89% of the elderly reported that none of their usual activities were made impossible due to health reasons, while 93% said they did not have total difficulty in performing IADL. When these limitations were present, however, the chances of individuals reporting a negative perception of

health were 3.20 and 2.04 times greater. Regarding morbidities, 62% had had either a physical or mental chronic disease diagnosed, and this condition was responsible for increasing the chances of the individual having a negative perception of health 2.44-fold. In elderly persons with a negative perception of oral health (19%), the odds ratio for assessing overall health negatively was 1.92 times greater than those who considered their oral health to be positive.

Regarding the use of health services, 76% of respondents had required treatment at a health service in the two-week period prior to the collection of PNS data. The majority of the elderly persons had had up to three medical appointments in the previous year (42%) and 90% of the participants were hospitalized in the same period (Table 1). The higher frequencies of these events were associated with a greater chance of an elderly patient having a negative perception of health (Table 2).

Table 1. Descriptive analysis of the independent variables related to the health perception of the Brazilian elderly. PNS, Brazil, 2013.

Dependent variable	Total	Positive perception	Negative perception
Overall perception of health	N (%)	N (%)	N (%)
	23.815 (100)	10.461 (44)	13.354 (56)
Independent variables and classes	Total	Positive perception	Negative perception
	N (%)	N (%)	N (%)
Literate			
Yes	17.985 (76)	8.676 (52)	9.309 (48)
No	5.830 (24)	1.785 (31)	4.045 (69)
Level of schooling			
University or higher	2.343 (10)	1.680 (72)	663 (28)
High School	3.253 (14)	1.917 (59)	1.336 (41)
Elementary school	2.247 (9)	955 (43)	1.292 (57)
Literate	10.142 (43)	3.908 (39)	6.234 (61)
Did not answer	5.830 (24)	---	---
Performance of any usual activities made impossible due to health reasons			
No	21.141 (89)	10.070 (48)	11.071 (52)
Yes	2.674 (11)	391 (15)	2.283 (85)
Total Difficulty in Performing Instrumental Activities of Daily Living			
No	22.265 (93)	10.194 (46)	12.071 (54)
Yes	1.550 (7)	266 (17)	1.282 (83)
Diagnosis of any chronic, physical or mental illness			
No	8.988 (38)	2.551 (28)	6.437 (72)
Yes	14.827 (62)	7.910 (53)	6.917 (47)
Oral Health Assessment			
Positive	6.734 (28)	3.613 (46)	3.121 (54)
Negative	4.443 (19)	1.319 (30)	3.124 (70)
Did not respond	12.638 (53)	--	--
Sought a place, service or health professional for care related to own health in last two weeks			
No	5.605 (24)	1.774 (32)	3.831 (68)
Yes	18.210 (76)	8.687 (48)	9.523 (52)

to be continued

Continuation of Table 1

Dependent variable	Total	Positive perception	Negative perception
Number of doctor visits in the last 12 months			
Up to 3 times	10.079 (42	5.035 (50)	5.044 (50)
4 to 6 times	5.490 (23)	1.916 (35)	3.574 (65)
7 to 9 times	1.007 (4)	295 (29)	712 (71)
10 to 14 times	2.125 (9)	511 (24)	1.614 (76)
15 to 19 times	270 (1)	59 (22)	211 (78)
From 20 to 29 times	348 (1)	60 (17)	288 (83)
30 or more times	184 (1)	26 914)	158 (86)
Did not respond	4.312 (18)	--	--
Hospitalization in previous 12 months			
No	21.438 (90)	9.864 (46)	11.574 (74)
Yes	2.377 (10)	597 (25)	1.780 (75)

Table 2. Odds ratio for negative perception of overall health according to independent variables. PNS, Brazil, 2013.

Variable	Odds Ratio (OR)
Literate	
Yes	1.00
No	1.48
Level of schooling	
University	1.00
High school	1.11
Elementary	1.42
Literate	1.77
Perform of any usual activities made impossible health reasons	
No	1.00
Yes	3.20
Total Difficulty in Performing Instrumental Activities of Daily Living	
No	1.00
Yes	2.04
Diagnosis of any chronic, physical or mental illness	
No	1.00
Yes	2.44
Oral Health Assessment	
Positive	1.00
Negative	1.92
Sought a place, service or health professional for care related to own health in last two weeks	
No	1.00
Yes	1.16

to be continued

Continuation of Table 2

Variable	Odds Ratio (OR)
Number of doctor visits in the last 12 months	
Up to 3 times	1.00
4 to 6 times	1.17
7 to 9 times	1.27
10 to 14 times	1.62
15 to 19 times	1.52
From 20 to 29 times	2.00
30 or more times	2.70
Hospitalization in previous 12 months	
No	1.00
Yes	1.40

DISCUSSION

The prevalence of the total number of elderly persons assessed by the PNS and who formed part of the present study with a negative perception of health was 56%. This finding diverged from smaller-scale Brazilian studies, which identified a prevalence of a negative perception of health of between 17.1%[6] and 35.0%[15] of elderly participants, respectively.

The data of the present study regarding a negative perception of health are similar to the results of studies involving institutionalized or co-resident elderly persons, which revealed that approximately 60% of such individuals were dissatisfied with their own health[6,12]. These findings are worrying as a negative perception of health can predict or be related to situations of functional decline, dependency, hospitalizations, and have a direct influence on the mortality rates of the elderly[6,10-12].

The data from the PNS 2013 study in relation to those aged 60 years or older were collected through interviews with the elderly person in question or another resident of the household, a strategy frequently used in Brazilian surveys[20]. Despite initial fears that such responses may not reflect the real situation of the individual, available scientific studies have shown that the selection of the respondent for data acquisition does not contribute significantly to changes in results[20,21], justifying the use of this method.

Some factors that directly interfere in the perception of health have previously been identified, such as schooling. Illiterate individuals have a higher tendency to perceive themselves as having a poor health situation[10,14], in line with the results found here, where the odds ratio of a poor health assessment generally underwent a gradual decline as years of schooling increased. The role of schooling as a protective factor in relation to the health of the individual is intertwined with the opportunity to obtain knowledge and access to information, aspects that affect the way that these elderly people conduct their daily routines and their choice of life of habits, improving self-care and reducing the propensity to develop diseases[14].

The results also show that individuals who are unable to perform any of their usual activities due to health are more likely to describe their health as bad than those who do not have such difficulties. The same is true with total difficulty in the performance of IADL. Such activities are considered more complex than BADL as they include independence within the community as well as cognitive aspects[3]. The reduction or deprivation of autonomy, due to the limitations repeatedly imposed by the presence of diseases and their aggravations, can make individuals feel incapable, which is a contributing factor to a negative perception of health[3,22,23].

In addition to the aforementioned aspects, it was also found that elderly people with a diagnosis of chronic physical or mental illness are more likely (OR =2.44) to perceive themselves as having poor health than individuals who do not have such a diagnosis. The conditions imposed by the presence

of diseases influence physical, social, cultural and economic aspects, modifying the quality of life of subjects and contributing to a negative perception of health. Studies show that a greater number of diseases present is linked to inferior functional capacity and worsened perception of health among individuals[6,10]. Knowledge and reflection about the perception of health of the elderly allow health professionals to individualize strategies of education and care, generating greater adherence to treatment and improvement in quality of life.

A similar condition was also observed in relation to oral health, where the data showed that a negative classification of disease results in a greater possibility of elderly persons also considering their general health to be poor (OR =1.92). This is unsurprising, as the oral cavity is part of the individual and is today considered to have a direct influence on overall health, contributing to high levels of quality of life and health perception[24-26].

In elderly individuals, oral health conditions are directly influenced by functional conditions, which may compromise dental hygiene capacity. This in turn can make the elderly person dependent on relatives or caregivers for the performance of such actions, a situation that can be difficult to accept[27]. Despite its growing importance in the field of health, the area of oral health still has room to develop, focusing on actions aimed at groups who previously lacked access to dental care or suffered invasive treatment, as is the case with the elderly population. Reinserting or inserting these individuals into public health policies is a constant challenge for administrators[24,27,28], as oral health conditions lead to negative outcomes for nutritional, social and health aspects[29].

Elderly persons who sought health services in the two weeks prior to the original study were more likely to evaluate their overall health as poor, as were those with a large number of annual medical visits and individuals who had been hospitalized in the previous 12 months. The great demand for the use of services among individuals with negative self-perceptions of health may reflect the presence of diseases, especially those that are chronic and degenerative, and functional incapacity, relationships described above. Studies show that elderly people with more severe functional limitations and a diagnosis of more diseases require greater use of health services than those who have diseases that do not impose physical limitations[3,10,23,28,30]. The difficulties experienced by individuals in situations of chronic illness and hospitalization, such as the efforts expended to gain access to the health services, are therefore directly related to their negative health evaluation.

Appointments with a medical professional, however, may not only involve treatment, but can also represent an early opportunity to perform diagnoses, referrals to other services and actions related to disease prevention[28]. State protocols, such as in the state of Paraná, recommend three annual consultations for elderly individuals at risk of frailty[31], consistent with the average number of consultations described by the majority of elderly persons investigated. To minimize superfluous use, the improvement of guidelines and adequate follow-up among family members and caregivers is suggested[32].

Excessive consultations in a short period of time, as in the case of a group of individuals in the present study, may be related to the resolutive nature of health services[28]. These aspects are worth reflecting on, as often the direction taken by health administrators and professionals does not offer satisfactory answers to the real health needs of the population, generating gaps and dysfunctions in the effectiveness of a health service or system.

One limitation of the present study is that the outcome variable *Perception of health* could be responded to by a member of the household and not necessarily by the elderly individual; and that such a variable relies on the intrinsic subjectivity of the perception of health. As such it can be altered by contextual conditions and the emotional and physical state in which the individual finds themselves at the time when data collection takes place[10-12]. However, such subjectivity does not remove its relevance for guiding policy decisions and health planning [33].

CONCLUSION

The influence of multiple aspects that determine the negative perception of the health of Brazilian elderly persons was identified, namely: level of educational instruction, difficulty in performing instrumental activities of daily living, impossibility

of performing any usual activity for a reason of health, diagnosis of chronic disease, poor oral health condition, a heightened demand for health services, medical consultations and hospitalizations.

The broad theoretical and methodological analysis of the present study provides thorough knowledge of the factors that result in the negative health perception of the elderly population. This allows the potential use of such knowledge in the formulation of public health policies aimed at such a population, supporting the planning of more preventive strategies and improving the quality of the services offered, providing a higher quality of life in longevity.

It is reiterated here that the findings of this study are applicable for strategies in the fields of individual empowerment, health promotion and the provision of early access to health services.

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