Factors associated with the frequency of medical consultations by older adults: a national study

Fatores associados à frequência de consultas médicas por idosos: estudo de base nacional

Factores asociados con la asistencia a consultas médicas por personas mayores: estudio de base nacional

How to cite this article:
Meier JG, Cabral LPA, Zanesco C, Grden CRB, Fadel CB, Bordin D. Factors associated with the frequency of medical consultations by older adults: a national study. Rev Esc Enferm USP. 2020;54:e03544. DOI: http://dx.doi.org/10.1590/51980-220X2018048103544

Objective: To analyze factors associated with the high frequency of medical consultations (five or more consultations) among older adult participants of the National Health Survey – 2013. Method: A quantitative cross-sectional study conducted with data from individuals aged 60 years and over (n = 19,503). The outcome variable came from the question: 'How many times have you consulted the doctor in the last 12 months? Fifty-seven (57) independent variables were listed. The Waikato Environment for Knowledge Analysis software program was used in the analysis. The data set was balanced and the dimensionality reduction test was performed. The variables which were strongly related to the dependent variable were analyzed using logistic regression. Results: The independent variables listed were strongly related to the outcome variables: female gender, negative self-perception of health condition, inability to perform usual activities for health reasons, diagnosis of chronic disease, seeking health services for health-related care, and hospitalization. Conclusion: The results reflect the relevance of expanding and qualifying services through effective prevention, protection and health promotion actions.

ABSTRACT

Objective: To analyze factors associated with the high frequency of medical consultations (five or more consultations) among older adult participants of the National Health Survey – 2013. Method: A quantitative cross-sectional study conducted with data from individuals aged 60 years and over (n = 19,503). The outcome variable came from the question: 'How many times have you consulted the doctor in the last 12 months? Fifty-seven (57) independent variables were listed. The Waikato Environment for Knowledge Analysis software program was used in the analysis. The data set was balanced and the dimensionality reduction test was performed. The variables which were strongly related to the dependent variable were analyzed using logistic regression. Results: The independent variables listed were strongly related to the outcome variables: female gender, negative self-perception of health condition, inability to perform usual activities for health reasons, diagnosis of chronic disease, seeking health services for health-related care, and hospitalization. Conclusion: The results reflect the relevance of expanding and qualifying services through effective prevention, protection and health promotion actions.

DESCRIPTORS

Aged; Health of the Elderly; Indicators of Health Services; Interdisciplinary Placement; Health Services; Geriatric Nursing.
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INTRODUCTION

The change in the age structure in society due to reduced birth rates and increased life expectancy is not always accompanied by changes which ensure decent conditions during aging(1-6). The added amount of years lived has contributed to a higher incidence of diseases(7), especially chronic non-communicable diseases, which contribute to a worsening in functional disability and compromise the quality of life of older adults(6,8).

The indicated changes have a direct impact on the increased demand for healthcare(8,9), regardless of the modality to be taken advantage of and its purpose, with consultations with a medical professional being one of the most recurrent alternatives(4,9). It is well known that medical appointments are a promising instrument for early diagnosis, preventive action, treatment and necessary guidance. However, excessive use (five or more consultations) of this type of care may reflect the low resolution of health services, with negative repercussions in terms of economic and service levels, personal and collective contexts(2).

In view of the above and the lack of studies related to the theme, it is necessary to know the factors which increase the use of medical consultations by Brazilian older adults, with a view to make adjustments in planning health actions which reduce unnecessary use of services, and provide value for quality and resoluteness with an emphasis on actions aimed at health promotion and prevention. Thus, in taking advantage of the significant position occupied by population-based surveys for assertive health decision-making, the objective of the present study was to learn the factors associated with the high frequency of medical consultations among Brazilian older adults participating in the current National Health Survey of 2013 (PNS - Pesquisa Nacional de Saúde) – 2013), thereby analyzing broad socioeconomic and health conditions.

METHOD

STUDY DESIGN

This is a cross-sectional quantitative study with secondary data from a population-based survey (PNS – 2013), proposed by the Ministry of Health and conducted by the Brazilian Institute of Geography and Statistics (IBGE – Instituto Brasileiro de Geografia e Estatística)(10).

POPULATION

The study is household-based and the sampling plan implemented a probabilistic three-stage cluster sampling, with the census tract set being the primary sampling units; the households being the secondary units, and the selected older residents as the tertiary units(10).

The sample size was defined considering the desired level of precision for the estimates of some indicators of interest, resulting in information from 205,546 individuals residing in 60,202 investigated households(10). For the present study we considered the information which came from older adults (n = 23,815). Details on the sampling and weighting process are available in the PNS-2013 report(10-11).

DATA COLLECTION

Data were collected by previously trained researchers. The information was obtained through individual interviews and stored on handheld computers. The participants were individuals over 18 years old. The interview was directed by three forms: the household, referring to the characteristics of the household; relating to all residents of the household; and the individual, answered by a randomly selected resident of the household who was 18 years of age or older(10). We exclusively considered data from individuals over 60 years old from the last two forms in this study. Data from the PNS-2013 are publicly and freely available on the IBGE website.

DATA ANALYSIS AND PROCESSING

The outcome variable ‘Frequency of doctor visits in the last 12 months’ results from the question: How many times have you consulted the doctor in the last 12 months? with numerical values as answers. Responses were grouped into up to 04 consultations and 05 or more medical consultations for the purpose of analysis in the present study. The presented categorization was adopted following the document “Parameters for programming basic health actions” of the Ministry of Health, which demands 3 annual consultations in primary care and 1 consultation at specialized level(12).

In this categorization process it was found that 4,312 (18%) did not answer the guiding question of the dependent variable, which were excluded from the sample. Thus, the final sample totaled 19,503 older adults.

In the pre-exploration phase, 57 variables of interest were listed to compose the independent variables, being related to: sociodemographic characteristics; limitations and illness; difficulties in performing basic and instrumental activities of daily living; use of health services; hospitalizations and medical emergencies; and life habits (Chart 1). All variables underwent processing, numerical variables were transformed into categorical variables, some variables were recategorized, and others dichotomized as recommended in the literature.

The subsequent step comprised balancing the data set in order to equalize the categories of the dependent variable benefiting the analysis procedure. For this step, the list of available balancing algorithms was tested, and the Resample algorithm was chosen due to its efficiency and compatibility with the study. Resample is a data preprocessing tool included in the data mining software program entitled Waikato Environment for Knowledge Analysis (WEKA)(13). Next, the dimensionality reduction test was performed through the attribute selection method using the filter approach available in WEKA, using the Correlation-based Feature Selection (CFS) algorithm(14), using the 10-Fold Cross-validation method.
### Chart 1 – Description of the independent variables used in the study – PNS, Brazil, 2013.

| Sociodemographic characteristics          |                   |
|-------------------------------------------|-------------------|
| Gender                                    | Civil status      |
| Age                                       | Literacy          |
| Skin color/race                           | Education level   |
| Living with a partner                     | Income            |

| Physical limitations                     |                   |
|------------------------------------------|-------------------|
| Self-perception of health condition      | Bedridden         |
| The presence of chronic illness, physical or mental, somewhat limits your usual activities | Number of days bedridden |
| Has failed to perform any of their usual activities for health reasons | Movement difficulty |
| Number of days no longer performing their usual activities for health reasons | Vision difficulty |

| Difficulties Performing Basic Activities of Daily Living |                   |
|---------------------------------------------------------|-------------------|
| Difficulty eating alone with a plate in front of them, including holding a fork, cutting food and drinking from a glass | Difficulty having a bath by themselves, including getting in and out of the shower or bathtub |
| Difficulty in going to the bathroom alone including sitting down and getting up from the toilet | Difficulty walking at home alone from room to room |
| Difficulty to get dressed alone | Difficulty in getting into bed to lie down, or out of bed alone |
| Difficulty in sitting down or getting up from a chair alone |                   |

| Difficulties in performing Instrumental Activities of Daily Living |                   |
|------------------------------------------------------------------|-------------------|
| Has difficulty to buy groceries alone                            | Has difficulty to manage finances alone |
| Has difficulty in taking medications alone                       | Has difficulty to go to the doctor alone |
| Has difficulty to go out alone using transportation              | Has difficulty to manage finances alone (to manage their own money) |

| Chronic diseases |                   |
|------------------|-------------------|
| Presence of any chronic physical or mental illness | Work-related musculoskeletal disorder |
| Diabetes         | Arthritis          |
| Hypertension     | Depression         |
| High Cholesterol | Chronic Obstructive Pulmonary Disease |
| Stroke or brain hemorrhage | Cancer |
| Chronic back pain | Chronic kidney problem |

| Use of health services |                   |
|------------------------|-------------------|
| Place they usually seek care when they are sick | Reason for seeking care |
| Time since last medical appointment          | Where they last sought healthcare |
| Have searched for a place, service, or health professional for health-related care in the last two weeks | Have used some integrative and complementary practice, i.e. treatment such as acupuncture, homeopathy, medicinal plants and herbal medicine etc. |
| Usually attend the same place, same doctor or same health service when they need health care | Have any prescription drugs at their last visit |

| Hospitalizations and medical emergencies |                   |
|------------------------------------------|-------------------|
| Hospitalization in the last year         | Time hospitalized |
| Number of hospitalizations in the last year | Emergency care at home |
| Reason for hospitalization               |                   |

| Lifestyle habits |                   |
|------------------|-------------------|
| Drink alcohol    | Perform physical activity |
| Consume tobacco  |                   |
Moving forward, only the variables that showed great competence to elucidate the outcome variable were evaluated, eliminating non- legitimate connections with the independent variables. The employability of this methodology allows us to uncover potentially useful, highly reliable and previously unknown aspects.

Finally, the independent variables related to the dependent variable were evaluated using logistic regression to determine the scope of the associations. Logistic regression makes it possible to understand the chances for the occurrence of a given question, starting from a binary dependent variable and a grouping of independent predictive variables. The formed model had an explanatory capacity of 65.5%.

All analyzes were performed using WEKA software program, chosen for the present study due to its free availability, efficacy, agility and credibility.

**ETHICAL ASPECTS**

The PNS-2013 was approved by the National Commission of Ethics in Research for Human Beings of the Ministry of Health under the opinion number 328.159, of June 26, 2013, respecting the Resolution 466/12 of the National Health Council. Thus, the use of data generated by the PNS-2013 does not require further approval by ethics committees. It is noteworthy that the Ministry of Health encourages these data to be widely used in the most diverse ways and using different analysis approaches, as was done in the study under analysis, in order to subsidize and considerably expand the knowledge about the health characteristics of the Brazilian population.

**RESULTS**

The descriptive analysis showed that 64% (n = 12,467) of the investigated older adults needed up to four medical appointments and 36% (n = 7,036) had five or more appointments, considering the 12 months preceding the survey.

Of the 57 variables considered for analysis, six were strongly related to the frequency of medical appointments over a period of up to 12 months, namely: gender; self-perception of general health condition; inability to perform any usual activities for health reasons; diagnosis of chronic disease; seeking a place, service or health professional for health-related care in the last two weeks and; hospitalization in the last year. All variables presented a percentage of 100 in the 10-fold cross-validation method which enables measuring the link between the independent and dependent variables.

Table 1 highlights the descriptive analysis of the independent variables that were related to the annual frequency of medical appointments among Brazilian older adults, while Table 2 shows the odds ratios of older adults needing too many annual medical appointments, according to the independent variables.

Taking into consideration five or more medical appointments within a 12-month period, women were at higher odds of using the service over men (Table 1). Most of the older adults had a negative perception of health and had some kind of chronic disease (Table 1), which is responsible for increasing the chances of the individual having consulted the health service four times a year by 1.95 and 1.63 times, respectively, compared to positive perception and absence of disease (Table 2). Also, most of the investigated older adults reported not being unable to perform any usual activities for health reasons, or having sought a service or health professional for health-related care in the last two weeks, and having been hospitalized (Table 1). However, when these physical limitations and search for services are present, the chances of the older adult to have a high frequency of medical consultations were 1.37, 2.54 and 2.45 times, respectively (Table 2).

### Table 1 – Descriptive analysis of independent variables related to the frequency of annual medical consultation in Brazilian older adults – PNS, Brazil, 2013.

| Independent variable and classes | Up to 04 consultations | 05 or more consultations | Total |
|---------------------------------|------------------------|--------------------------|-------|
|                                 | N (%)                  | N (%)                    | N (%) |
| **Gender**                      |                        |                          |       |
| Male                            | 5431 (68)              | 2515 (32)                | 7946 (41) |
| Female                          | 7036 (61)              | 4521 (39)                | 11557 (59) |
| **Self-perception of general health condition** |                        |                          |       |
| Positive                        | 5958 (75)              | 1944 (25)                | 7902 (41) |
| Negative                        | 6509 (56)              | 5092 (44)                | 11601 (59) |
| **Has a doctor diagnosed them with any chronic, physical or mental illness, or long-term illness (over six months)** | | | |
| No                              | 4489 (58)              | 3243 (42)                | 7732 (40) |
| Yes                             | 7978 (68)              | 3793 (32)                | 11771 (60) |
| **Unable to perform any of their usual health activities in the last two weeks** | | | |
| No                              | 1073 (16)              | 5594 (84)                | 6667 (34) |
| Yes                             | 11394 (84)             | 1442 (11)                | 12836 (66) |
| **Have searched for a place, service, or health care for health-related care in the last two weeks** | | | |
| No                              | 9989 (72)              | 3974 (28)                | 13963 (72) |
| Yes                             | 2478 (45)              | 3062 (55)                | 5540 (28) |
| **Hospitalization in the last 12 months** | | | |
| No                              | 11511 (67)             | 5615 (33)                | 17126 (88) |
| Yes                             | 956 (40)               | 1421 (60)                | 2377 (12) |
The disease is already installed(20), reducing the number of years they live (22). On the other hand, women compared to individuals who did not have such condition. It is understood that the presence of chronic conditions can aggravate the health condition and intensify the use of health services(9). The negative repercussions resulting from the onset of chronic diseases fully affect the individual, and intensify when the appropriate follow-up is not performed(8).

Similarly, older adults who reported that they were unable to perform any habitual activity for any health reason considering the two weeks prior to data collection were related to more frequent medical appointments (OR = 1.37). It is understood that individuals with such restrictions often have poor health conditions. The presence of functional disability is commonly associated with comorbidities, making the demand for differentiated health care more frequent, in turn requiring actions of greater cost and complexity(8). These conditions tend to evolve progressively, aggravating the limitations for Basic Daily Life Activities (BADL)(24), increasing the incidence of hospitalizations and requiring routine medical consultations(27).

The need to seek some kind of service or health professional for health-related care considering the two weeks preceding the PNS-2013 data collection was identified as a factor which most contributed to the increased probability of having more than four medical appointments within 12 months (OR = 2.54). The reason for consultations with a medical professional was not considered, nor the periodicity of these consultations. In this sense, it is known that routine follow-up focusing on the maintenance of capacities and health conditions are predictors for successful aging. However, when these actions focusing on promotion and prevention are ineffective at the various healthcare levels, they lead to increased demand for health care(2), expressing inefficiency of services and inequality in supply(26).

Among the older adult participants of the PNS-2013, those who required hospitalization in the 12 months prior to the survey (for a period equal to or greater than 24 hours)
Conclusión: los resultados de este estudio deben ser cuidadosamente analizados, dado que la selección de ancianos del PNS-2013 fue utilizada en su totalidad para el estudio y no se consideraron posibles limitaciones en la salud de los ancianos, mientras que los individuos que no respondieron a la pregunta de la intervención de las variables dependientes también fueron excluidos del estudio. Además, se analizan las diferencias entre género y región de residencia de los individuos que no fueron analizados por separado. El estudio implementado no se aleja de los resultados del estudio y el influjo de aspectos que interfieren en la búsqueda de consultas con profesionales de salud para el grupo de ancianos de mayor edad en Brasil, constituyendo una base para futuros estudios con especificaciones delimitadas.

CONCLUSIÓN

Los hallazgos de este estudio reafirman el influjo de múltiples aspectos que interfieren en la búsqueda de consultas con profesionales de salud por ancianos brasileños. Los resultados se asocian con una carrera funcional, la presencia de enfermedades crónicas, comorbilidades y sus consecuencias como hospitalización, búsqueda de servicios de salud o profesionales, y percepción negativa de la salud. Por lo tanto, el importante de expandir y calificar servicios a los tres niveles de atención, especialmente de cuidado primario, se reafirma a través de acciones efectivas de prevención, protección y promoción de salud.
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