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Absence of routine medical consultation among hypertensive and/or diabetic elders: an epidemiological study based on the Brazilian National Household Survey 2008

Ausência de consulta médica de rotina entre idosos hipertensos e/ou diabéticos: um estudo epidemiológico baseado na Pesquisa Nacional por Amostra de Domicílios 2008

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ABSTRACT: *Objective*: This exploratory study aimed to investigate the predisposing, enabling and health need characteristics associated with lack of medical visits in the last 12 months, among 23,620 elderly hypertensive and/or diabetic individuals. *Methods:* In this research, we used the theoretical behavioral model of Andersen and Newman for use of health services. The data analyzed were produced by the health supplement of the Brazilian National Household Survey (PNAD) 2008, nationwide. To identify the associations, we used the Poisson regression model, which estimates the prevalence ratios and confidence intervals of 95%, considering the significance level of 5%. *Results:* The results showed that 10.6% of the study population did not consult the doctor in the period considered, and the prevalence was higher among hypertensive subjects (10.5%) than among diabetic ones (7.1%). The lack of medical consultation was negatively associated with female sex and increasing age (predisposing characteristics), with health insurance coverage (enabling characteristic), worse self-rated health, chronic health conditions selected and the presence of hypertension associated with diabetes (health needs), while the fact of living in the Northeast, North and Midwest appeared positively associated with the event under investigation. *Conclusion:* These results corroborate those observed in national and international studies and show evidence of inequality and inequity in the use of medical consultation for this population, based on the findings related to health plan coverage and geographic region.

Keywords: Medical consultation. Aged. Hypertension. Diabetes mellitus. Health surveys. Health services.

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RESUMO: *Objetivo:* O presente estudo, de caráter exploratório, teve como objetivo investigar as características predisponentes, facilitadoras e de necessidades de saúde associadas à não realização de consulta médica nos últimos 12 meses, junto a 23.620 idosos hipertensos e/ou diabéticos. *Métodos:* Nesta investigação, utilizou-se como referencial teórico o modelo comportamental de Andersen e Newman para utilização de serviços de saúde. Os dados analisados foram produzidos pelo Suplemento de Saúde da Pesquisa Nacional por Amostra de Domicílios (PNAD) 2008, de abrangência nacional. Para identificação das associações, utilizou-se o modelo de regressão de Poisson, que estima razões de prevalências e respectivos intervalos de confiança de 95%, considerando-se o nível de significância de 5%. *Resultados:* Os resultados mostraram que 10,6% da população estudada não consultaram o médico no período considerado, sendo que a prevalência foi maior entre hipertensos (10,5%) do que entre diabéticos (7,1%). A ausência de consulta médica esteve negativamente associada com o sexo feminino e com o aumento da idade (entre as características predisponentes), com a posse de plano de saúde (característica capacitadora), pior autoavaliação de saúde, presença de condições crônicas de saúde selecionadas e presença da hipertensão associada ao diabetes (entre as necessidades de saúde); já o fato de residir nas regiões Nordeste, Norte e Centro-Oeste apresentou-se positivamente associado ao evento investigado. *Conclusão:* Esses resultados corroboram o observado em estudos nacionais e internacionais e apontam indícios de desigualdade e iniquidade na utilização da consulta médica pelos idosos hipertensos e/ou diabéticos, a partir dos achados relativos à cobertura por plano de saúde e região geográfica.

Palavras-chave: Consulta médica. Idoso. Hipertensão. Diabetes mellitus. Inquéritos epidemiológicos. Serviços de saúde.

INTRODUCTION

The elderly population has been growing fast in Brazil[1], which has been associated with the increased prevalence of chronic non-communicable diseases (CNCD), incapacity and death[2]. Among the CNCDs, arterial hypertension (AH) and diabetes mellitus (DM) stand out, becoming a matter of concern, thus constituting important public health issues in all countries, regardless of the level of development[3].

AH, characterized by high and sustained blood pressure (BP) ($\geq$ 140 x 90 mmHg), is the most prevalent among all risk factors to develop cardiovascular diseases (CVD), has multifactorial etiology and is clearly related to aging[4]. Treatment and control of AH are basically based on drug therapy and changes in lifestyle (control of excess weight, incentive to regular physical activities, adoption of healthy diets, and others)[4]. Among the consequences of the low rates of AH control are stroke and ischemic heart disease (IHD), the two main causes of mortality among the Brazilian elderly population[2].

DM is a heterogeneous group of metabolic disorders, which have in common the high blood sugar rate (hyperglycemia), resulting from problems related to the secretion and/or action of insulin[5]. As is the case of AH, the treatment and control of DM2 can be carried out by drug therapy and drug free therapies (weight loss, adequate diet, fight against smoking and practice of physical activities)[6]. DM is usually associated with complications in the nervous and cardiovascular systems, as well as dysfunctions and failure of several organs,

especially eyes, kidneys, brain and heart[5-7]. Mortality caused by CVD and cerebrovascular diseases are the main consequences of DM[8], which leads to high morbimortality caused by kidney failure, lower limb amputation and blindness[7].

Currently, chronic diseases such as DM and AH represent an important public health issue in Brazil[9] and, among the elderly, these are mainly related to inadequate care and lack of control of the disease and its sequels[10]. Therefore, it is concluded that monitoring and continuous care coming from health services are essential to minimize the occurrence of the adverse effects caused by these conditions. Therefore, once they are diagnosed, the protocol regarding the management of these diseases recommends the periodical follow-up in medical appointments. It is also very important to carry out studies that can map the customary use (or not) of medical appointments with this specific population segment (hypertensive and/or diabetic elders). For the adherence to treatment and for the better control of pressure levels (in case of AH), and blood sugar levels (in case of DM), the attendance to medical appointments and continuous education of patients is essential[6]. Studies on the use of medical appointments by the elderly Brazilian population have been conducted[11,12], however, it is possible to observe the lack of studies addressed to the hypertensive and/or diabetic elderly population[11]. The need to know the characteristics of nonattendance to medical appointments in this population is important to plan health actions, once structural and functional changes in the country's health system require that this information on the use of services be periodically updated.

Considering the exposed, the objective of this study was to investigate the prevalence and the factors associated with the nonattendance to medical appointments in the past 12 months (routine appointments) by the population of Brazilian hypertensive and/or diabetic elders.

METHODS

AREA AND STUDY POPULATION

This is a cross-sectional and exploratory study that used data from the health supplement of the Brazilian National Household Survey (PNAD) of 2008, carried out by the Brazilian Institute of Geography and Statistics (IBGE)[13]. The health supplement started being included in 1998, and launched a historical five-year series approaching different themes about health conditions and use of health services. These supplements allow designing the profile of health needs, getting to know the risk and protective health factors, the access to the use of health services, the coverage by health insurance plans, among other aspects[13].

In PNAD 2008, the sampling process took place in three successive stages: cities, census sectors and households. In the sampled households all residents were eligible

for a face to face interview. The sample in that survey is representative of the Brazilian population[13]. This investigation was restricted to the participants of PNAD-2008, aged 60 years old or older (accounting for 23,620 elders), who reported history of medical diagnosis for AH and/or DM.

Study variables and data collection

The dependent variable was the nonattendance to medical appointments in the past 12 months, defined based on the negative answer to the question: "Have you seen a doctor in the past 12 months?".

The selection of independent variables was based on the model adopted to evaluate the use of health services, proposed by Andersen and Newman[14], who consider the contribution of predisposing, enabling and health need aspects. The predisposing characteristics considered were sex (female *versus* male), age in years ("60 – 64"; "65 – 69"; "70 – 74"; "75 – 79" and "80 or older") and schooling in terms of full years of regular school attendance ("< 1"; "1 – 8"; "9 – 11"; and "12 or more"). The enabling characteristics were monthly *per capita* family income in minimum wages ("< 1"; "1 – 1,9"; "2 – 3,9" and "4 or more"), area of residence (rural *versus* urban), coverage by health plan insurance (yes *versus* no) and macroregion of residence, considering the major Brazilian geographic regions (Southeast; South; Northeast; North and Center-West).

The variables describing health needs were health self-assessment, functional capacity and history of medical diagnosis for some selected chronic conditions. Health self-assessment was measured by the question: "Generally, do you consider your health status to be very good, good, regular, poor or very poor?", and the answers were combined in three categories ("very good/good", "regular" or "poor/very poor"). In the assessment of functional capacity, the level of difficulty was considered ("none"; "minor" and "major/cannot do it") to carry out three basic activities of daily living (ADL) — eating, taking a bath or going to the bathroom —, gathered in a single question. ADLs are considered necessary for survival, and major difficulties or the impossibility to accomplish any of them without assistance indicate the presence of severe functional incapacity, a more advanced stage in the process of functional decline.

The following chronic diseases were included in the study: back condition, arthritis or rheumatism; cancer; heart disease; chronic kidney failure and depression. All of these diseases affect the person for a long time, and require constant medical care in times of crisis or to monitor the clinical condition. Participants were categorized based on their status regarding AH and DM, considering the isolated or simultaneous presence of these diseases (only hypertensive; only diabetic; hypertensive and diabetic). Since sometimes another person informed about the health characteristics of the participant, it was chosen to use the variable "close acquaintance" to adjust the analyses by the type of respondent.

Data analysis

The association between the explanatory variables and the event was tested by the Poisson regression. In the first step of the analysis, for each one of the three blocks of variables, crude (univariate analysis) and adjusted prevalence ratios (multivariate analysis, restricted to the variables in the block) were estimated with the respective 95% confidence intervals. Then, a new multivariate analysis was conducted (final model), including all of the variables which, in the multivariable analysis by block, remained significantly associated with the event, at a 5% significance level. This same level of significance was adopted to identify the variables that remained independently associated with the event, in the final multivariate model.

The statistical analysis was conducted with the resource in the software Stata®, version 10.0. Since the sampling design of PNAD incorporates all aspects defining a sampling plan as being complex (stratification, conglomeration, uneven selection probabilities in one or more stages and adjustment of sampling weights), the data analysis considered special statistical procedures (module *svy*), allowing the expansion of the sample based on weighting factors.

This study used the public data obtained from secondary sources, which, in this case, was PNAD, carried out to protect the privacy of its participants, thus ensuring their anonymity and voluntary participation. There are no conflicts of interest from the authors.

RESULTS

Among the 41,268 elders (60 years old or older) interviewed in PNAD-200, who responded the Health Supplement, 23,620 (57.2%) reported history of medical diagnosis for AH and/or DM and were included in this study. Most participants were women (61.1%), with mean age of 70.3 years old (50.2% were younger than 70), presenting low schooling (84.5% with complete elementary school and only 6.1% with incomplete or complete higher education), and 70.2% were part of families whose monthly income was lower than 2 national minimum wages (1 minimum wage – MW = R$ 415.00).

The prevalence of nonattendance to medical appointments in the past 12 months was 10.6% (95%CI 10.1 – 11.2); among the hypertensive ones, it was 10.5% (95%CI 10.0 – 11.0) and, among the diabetic ones, it was 7.1% (95%CI 6.3 – 7.8). Tables 1 to 3 describe, respectively, the distribution of predisposing, enabling and health need characteristics in the study population, as well as the prevalence of the investigated event for the 3 sets of explanatory variables and crude and adjusted prevalence ratios (inside each block).

Regarding the predisposing characteristics, the probability of not having been to a doctor was lower among women, and decreased with age and schooling. All of the predisposing characteristics are significantly ($p < 0.05$) associated with the event, both in the univariate and in the adjusted analysis. The multivariate model for the predisposing

Table 1. Crude and adjusted prevalence ratios, with respective 95% confidence intervals, for the association between predisposing characteristics and lack of medical consultation in the last 12 months per hypertensive and/or diabetic elder subjects, Brazilian National Household Survey, 2008.

Predisposing characteristics	Total population (%)	Nonattendance to medical appointments (%)	CPR* (95%CI)	APR** (95%CI)
Sex				
Male	38.9	13.8	1.00	1.00
Female	61.1	8.6	0.62 (0.58 – 0.67)	0.62 (0.57 – 0.67)
Age (years)				
60 – 64	28.3	11.6	1.00	1.00
65 – 69	24.4	10.9	0.94 (0.84 – 1.06)	0.93 (0.83 – 1.04)
70 – 74	19.4	10.6	0.92 (0.81 – 1.04)	0.89 (0.79 – 1.01)
75 – 79	14.0	9.0	0.78 (0.68 – 0.90)	0.76 (0.66 – 0.88)
≥ 80	13.9	9.6	0.83 (0.71 – 0.97)	0.81 (0.69 – 0.95)
Full schooling years				
< 1	32.6	11.7	1.00	1.00
1 – 8	52.2	10.3	0.88 (0.80 – 0.97)	0.85 (0.77 – 0.93)
9 – 11	9.0	9.6	0.82 (0.69 – 0.97)	0.76 (0.64 – 0.90)
≥ 12	6.2	9.6	0.82 (0.67 – 1.00)	0.71 (0.58 – 0.87)

*Estimated by Poisson regression model; **adjusted for predisposing variables described in table.
CPR: crude prevalence ratio; 95%CI: confidence interval of 95%; APR: adjusted prevalence ratio.

characteristics estimated adjusted prevalence ratios close to those resulting from the univariate analysis. The predisposing variable that was mostly associated with the lack of medical appointments was sex (prevalence ratio – PR = 0.62; 95%CI 0.57 – 0.67). More details can be seen in Table 1.

The results regarding the enabling characteristics are shown in Table 2. The absence of medical appointments was more frequent among the hypertensive and/or diabetic elders living in the rural zone and in cities from geographic regions other than the Southeast; the opposite tendency was observed for the elderly with higher *per capita* family income, covered by a health insurance plan. In the univariate analysis, only the status of cohabitating (living alone) was not associated (p < 0.05) with the absence of

Table 2. Crude and adjusted prevalence ratios, with respective 95% confidence intervals, for the association between enabling characteristics and lack of medical consultation in the last 12 months per hypertensive and/or diabetic elder subjects, Brazilian National Household Survey, 2008.

Enabling characteristics	Total population (%)	Nonattendance to medical appointments (%)	CPR* (95%CI)	APR** (95%CI)
Per capita income in minimum wages (MW)***				
< 1	29.3	12.0	1.00	1.00
1 – 1,9	40.9	10.9	0.91 (0.82 – 1.01)	1.00 (0.90 – 1.10)
2 – 3,9	16.6	9.0	0.75 (0.65 – 0.86)	0.99 (0.85 – 1.16)
≥ 4	13.2	8.7	0.73 (0.62 – 0.85)	1.12 (0.94 – 1.33)
Area of residence				
Urban	85.1	10.0	1.00	1.00
Rural	14.9	14.0	1.40 (1.25 – 1.57)	1.20 (1.06 – 1.35)
Macroregion of residence				
Southeast	49.0	9.2	1.00	1.00
South	15.9	10.8	1.17 (1.00 – 1.37)	1.11 (0.95 – 1.30)
Northeast	24.4	12.6	1.37 (1.21 – 1.54)	1.19 (1.05 – 1.35)
North	4.7	13.4	1.45 (1.22 – 1.73)	1.29 (1.08 – 1.53)
Center-West	6.1	11.5	1.24 (1.07 – 1.45)	1.19 (1.02 – 1.39)
Coverage by health plan				
No	69.6	12.4	1.00	1.00
Yes	30.4	6.7	0.54 (0.48 – 0.60)	0.56 (0.49 – 0.64)
Living alone				
No	85.9	10.7	1.00	1.00
Yes	14.1	10.4	0.97 (0.86 – 1.10)	0.99 (0.87 – 1.13)

*Estimated by Poisson regression model; **adjusted by enabling variables described in table; ***at that time: 1 minimum wage - MW = R$ 415,00.
CPR: crude prevalence ratio; 95%CI: confidence interval of 95%; APR: adjusted prevalence ratio.

medical appointment. In the multivariate analysis of the factors composing this block, the association of the event with the income lost statistical significance. The health insurance coverage was the enabling variable that was mostly associated with the event (PR = 0.56; 95%CI 0.49 – 0.64).

Table 3 describes the results related to the analysis of health need variables. Consistently, it was less likely to find a report of nonattendance to medical appointments in the past 12 months among elders with worse health status. Specifically in the case of AH and DM, no differences were observed in the prevalence of the event among those who presented only one of the conditions; however, in comparison to them, elders who were simultaneously hypertensive and diabetic presented lower prevalence of the investigated event. All of the health need variables were significantly (p < 0.05) associated with the nonattendance to medical appointments. In the multivariate analysis in the block of health needs, the associations with functional incapacity and kidney failure lost statistical significance. It was possible to observe a dilution in the strength of association for the other variables that remained statistically associated with the event. The stronger associations were observed for cancer (PR = 0.37; 95%CI 0.23 – 0.60), heart disease (PR = 0.58; 95%CI 0.51 – 0.66) and being hypertensive and diabetic (PR = 0.50; 95%CI 0.43 – 0.58).

Table 4 describes the results of the multivariate analysis, which identified the predisposing, enabling and health need characteristics independently associated with the nonattendance to medical appointments in the past 12 months. Among the predisposing characteristics, being female (PR = 0.64; 95%CI 0.59 – 0.69) and between 75 – 79 years old (PR = 0.86; 95%CI 0.74 – 0.99) remained negatively and independently associated with the event; schooling was no longer associated after including the enabling and health need characteristics.

Concerning the block of enabling characteristics, the macroregion of residence and the coverage of health insurance plan remained independently associated to the event. Independent associations were observed for the Northeast (PR = 1.19; 95%CI 1.05 – 1.35), North (PR = 1.30; 95%CI 1.10 – 1.55) and Center-West (PR = 1.21; 95%CI 1.04 – 1.41) regions, but the same was not true for the South Region. The health insurance coverage was negatively and independently associated with the event (PR = 0.55; 95%CI 0.49 – 0.63); the household region was no longer significant to explain the absence of medical appointments.

All variables describing health status (health need variables) remained independently associated with the nonattendance to medical appointment. Health self-assessment presented a dose-response gradient in its association (PR = 0.72; 95% CI 0.65 – 0.79) for regular, and PR = 0.53; 95%CI 0.45 – 0.63 for poor / very poor. The probability of not seeing a doctor among hypertensive and diabetic elders was approximately half of that observed among only hypertensive elders (PR = 0.54; 95%CI 0.46 – 0.62). Among the health conditions, only kidney failure was not independently associated with the investigated event; cancer

Table 3. Crude and adjusted prevalence ratios, with respective 95% confidence intervals, for the association between health need characteristics and lack of medical consultation in the last 12 months per hypertensive and/or diabetic elder subjects, Brazilian National Household Survey, 2008.

Health need variables	Total population (%)	Nonattendance to medical appointments (%)	CPR* (95%CI)	APR** (95%CI)
Health self-assessment				
Very good/good	34.4	14.3	1.00	1.00
Regular	48.6	9.5	0.67 (0.61 – 0.73)	0.83 (0.76 – 0.91)
Poor/very poor	17.0	6.3	0.44 (0.37 – 0.51)	0.69 (0.58 – 0.82)
Level of difficulty to perform ADL				
None	81.9	11.3	1.00	1.00
Minor	9.8	8.0	0.71 (0.60 – 0.85)	0.92 (0.76 – 1.10)
Major/cannot do it	8.3	7.3	0.65 (0.54 – 0.78)	0.98 (0.80 – 1.19)
Status regarding hypertension and diabetes				
Only hypertension	72.0	12.0	1.00	1.00
Only diabetes	7.1	12.3	1.02 (0.87 – 1.20)	0.96 (0.82 – 1.13)
Hypertension + diabetes	20.9	5.3	0.44 (0.38 – 0.51)	0.50 (0.43 – 0.58)
Arthritis				
No	70.9	12.0	1.00	1.00
Yes	29.1	7.2	0.60 (0.54 – 0.67)	0.76 (0.69 – 0.87)
Cancer				
No	97.3	10.8	1.00	1.00
Yes	2.7	3.3	0.31 (0.19 – 0.50)	0.37 (0.23 – 0.60)
Heart disease				
No	75.4	12.2	1.00	1.00
Yes	24.6	5.7	0.47 (0.41 – 0.53)	0.58 (0.51 – 0.66)
Chronic kidney failure				
No	95.7	10.8	1.00	1.00
Yes	4.3	5.6	0.51 (0.38 – 0.68)	0.80 (0.60 – 1.07)

Tabela 3. Continuation

Health need variables	Total population (%)	Nonattendance to medical appointments (%)	CPR* (95%CI)	APR** (95%CI)
Depression				
No	88.3	11.3	1.00	1.00
Yes	11.7	5.5	0.49 (0.40 – 0.59)	0.66 (0.55 – 0.81)
Back diseases				
No	60.6	12.5	1.00	1.00
Yes	39.4	7.8	0.63 (0.57 – 0.69)	0.75 (0.68 – 0.83)
Close acquaintance				
No	71.9	11.0	1.00	1.00
Yes	28.1	9.7	0.88 (0.80 – 0.97)	0.88 (0.80 – 0.97)

*Estimated by Poisson regression model; **adjusted by need variables in the table.
CPR: crude prevalence ratio; 95%CI: confidence interval of 95%; APR: adjusted prevalence ratio; DLA: daily life activities.

(PR = 0.38; 95%CI 0.23 – 0.61) and heart disease (PR = 0.60; 95%CI 0.53 – 0.68) stood out for the magnitude of the association.

DISCUSSION

The results in this study indicate that approximately one out of ten hypertensive and/or diabetic elders did not see a doctor constantly (being more frequent for hypertensive participants than diabetic ones), and factors associated with the event include characteristics belonging to the three sets of variables: predisposing, enabling and health needs.

One major difficult that is present in the discussion of our results is the lack of similar analyses, concerning the specificities of the study object and population. In this investigation, the focus was not on the medical appointment, and the inclusion criterion restricted the study population to elders with a history of medical diagnosis for AH and/or DM. Scientific literature has been producing reports of investigations addressed to identifying determinants regarding the use of health services among elders in general (including the medical appointment)[11,12,15]. The studies addressed to the use of health services by hypertensive and/or diabetic elders[11,12], or focused on medical appointments[11,16], are more often related to treatment, monitoring and control markers of these chronic conditions. Studies with purposes similar to ours are scarce[17], and, yet, methodological and contextual differences are present. Because of that, the discussion of our results will be often conducted based on studies that investigated the attendance to medical appointments by the elderly.

Table 4. Results of multivariate analysis of the association between predisposing, enabling and health need characteristics independently associated with the lack of medical consultation in the last 12 months per hypertensive and/or diabetic elder subjects, Brazilian National Household Survey, 2008.

Characteristics	PR (95%CI)*	p-value**
Sex (ref: male)		
Female	0.64 (0.59 – 0.69)	< 0.001
Age (ref: 60 – 64 years old)		
65 – 69	0.95 (0.85 – 1.07)	0.389
70 – 74	0.96 (0.85 – 1.09)	0.560
75 – 79	0.86 (0.74 – 0.99)	0.033
≥ 80	0.97 (0.83 – 1.13)	0.676
Macroregion of residence (ref: Southeast)		
South	1.16 (1.00 – 1.36)	0.054
Northeast	1.19 (1.05 – 1.34)	0.007
North	1.30 (1.10 – 1.55)	0.003
Center-West	1.21 (1.04 – 1.41)	0.012
Coverage by health plan (ref: no)		
Yes	0.55 (0.49 – 0.63)	< 0.001
Health self-assessment (ref: very good/good)		
Regular	0.72 (0.65 – 0.79)	< 0.001
Poor/very poor	0.53 (0.45 – 0.63)	< 0.001
Status regarding hypertension and diabetes (ref: only hypertension)		
Only diabetes	0.96 (0.82 – 1.12)	0.617
Hypertension + diabetes	0.54 (0.46 – 0.62)	< 0.001
Arthritis (ref: no)		
Yes	0.83 (0.74 – 0.94)	0.002
Cancer (ref: no)		
Yes	0.38 (0.23 – 0.61)	< 0.001

Table 4. Continuation.

Characteristics	PR (95%CI)*	p-value**
Heart disease (ref: no)		
Yes	0.60 (0.53 – 0.68)	< 0.001
Depression (ref: no)		
Yes	0.76 (0.62 – 0.92)	0.006
Back disease (ref: no)		
Yes	0.77 (0.70 – 0.85)	< 0.001
Close acquaintance (ref: no)		
Yes	0.86 (0.78 – 0.95)	0.002

*Estimated by Poisson regression and adjusted for all variables described in the table, besides age, schooling and residence area (not described in the table because of absence of significant results at p < 0,05 level);
**obtained by Wald test.
PR: prevalence ratios; 95%CI: 95% confidence interval; ref: reference.

In our study, the nonattendance to medical appointments was more frequent among hypertensive elders 910.5%) than diabetic ones (7.1%). In the specific case of hypertensive participants, the prevalence was similar to that observed in Bambuí (MG) (10.4%)[18], however, being lower to those detected in other Brazilian investigations. In a regional study conducted in the state of São Paulo, the proportion of elders with AH who did not see a doctor constantly reached 31.2%, and, among the elderly with DM, it was 23.1%[19]. In the city of Campinas (SP), this percentage was 28.4%, but, in that case, the adult population was investigated (20 years old or older)[20]. And among the elderly with CNCD living in the cities of the South and the Northeast, more than half (54.8%) did not see a doctor frequently[11]. However, the comparison of our results with those of the latter must consider some questions that distinguish ten: adult population[20] and time window used in the recal[11]. The findings show that the lower frequency of medical appointments among hypertensive patients in comparison to diabetic ones are consistent with those observed in the literature[19,21]. Maybe the highest risks of complications involving DM, in comparison to isolated AH, can contribute with the explanation for these findings.

With regard to predisposing characteristics, the variable sex was more strongly associated with the nonattendance to medical appointments: men stopped seeing a doctor more often. The literature has often associated the female sex to the more common use of health services[15,16,21,22], and our results corroborate these findings. The explanations for that involve different cultural and health issues, and, about the latter, it is possible because both AH and DM are more prevalent among women[7,19,20,23]. Regarding the cultural aspect,

women have a more accurate perception and value signs and symptoms of the disease more often, which is a result of the common sense that establishes women as being the caretakers of the family[9], not to mention their role in reproduction, thus making them more familiar to health services[22]. That is, as pointed out by a qualitative study, men perceive health care as being a female task, thus requiring services and health actions specifically addressed to their health[24].

In this study, the older elders no longer saw a doctor with lower frequency, even though the association has remained significant and independent only for the age group of 75 – 79 years old. Several studies have shown that older elders see the doctor more often and more intensively[15,25]. Older elders tend to present more health-related needs in comparison to younger elders, since comorbidity increases with age[15]. However, the association observed for age was maintained, regardless of the presence of other diseases. It is possible that aging can bring an additional load of complications and sequels related to AH and DM[6,7,9], and, in this sense, older hypertensive and/or diabetic elders would require more frequent medical appointments in search of prevention and control of these events.

Several national studies have been showing the improved access to health services in all Brazilian regions[11,26], which, in association with the absence of differences regarding the use of health services by geographic regions, can indicate the increasing equality in the offer of health services[26]. That, on the other hand, is consistent with the amplification of the Unified Health System (SUS) coverage, and can reflect both on the changes occurred in the socioeconomic context[18,27] and on the health care policy[27], thus reducing social inequalities and inequities regarding the access to health care, especially concerning less complex services (such as medical appointments)[26-28]. Our results, however, point to another direction, since regional differences were detected for the attendance to medical appointments, being less frequent among hypertensive and/or diabetic elders living in the Northeast, North and Center-West regions. These regions have the worst socioeconomic indicators (schooling, illiteracy rate, income and social insertion)[12]. Firstly, such a fact could lead to the hypothesis that social inequality would be the base for regional differences in the attendance to medical appointments, since the income enables the individual to access and use health services[29]; however, income did not remain associated with the nonattendance to medical appointments. Therefore, it is most likely that the observed regional inequality for the attendance to medical appointments is related to matters that are not included in this investigation, such as levels of offer, structure and organization of health services, besides the perception of these items by the users. There are signs of compromised effectiveness in the Family Health Program in primary health care in some cities from the Northeast region, resulting from many questions, like the presence of architectonic barriers to access health units, the excessive waiting time for the scheduled appointment, the disproportion between the number of users and the total of professionals available to assist them, as well as the insufficient skills of these professionals to care for AH and DM, resulting in the low use of services[12]. Data from PNAD show that Brazilians living in the Northeast, North and

Center-West regions have been indicating flaws in the health system as a reason for not meeting their health needs[17].

The positive association between coverage by health plan insurances and the attendance to medical appointments was identified in other national studies[16,28], and our results corroborate these findings. The fact that most health services are used by health insurance holders can constitute a mechanism to overcome barriers in the use of private services due to their costs[16], which can be owed to the perception that the accredited network is able to meet the health needs faster[22]. Based on the findings regarding the geographic regions, this is a reason for concern. In Brazil, only 26% of the population is covered by a health insurance plan[26,28], and, among the elderly, the Southeast and the South regions concentrate 80% of that coverage[30]. It is likely that the absence of a health insurance plan can partially explain the lower frequency of medical appointments among the residents from the Northeast, North and Center-West regions, and that this may contribute with the inequity of the use of health services[28]. This fact emphasizes the importance of SUS in these regions, in the sense that it overcomes the inequality in the access and use of health services.

As expected, our results indicate that the elderly in worse health conditions (who made a negative self-assessment of their health, who suffered from other specific chronic health conditions, who presented DM associated with AH and with the inability to perform ADL) no longer attended medical appointments in the last year less frequently. These results are in accordance with several other national[21] and international[15,25] studies. The apparent obviousness of such results does not reduce its importance, since it is worth to remember that health self-assessment is a robust predictor of mortality[31]; therefore, it allows identifying a group of hypertensive and/or diabetic elders who present an additional risk for the negative evolution of their clinical pictures, especially at the absence of a more frequent follow-up with a health professional. Regarding the investigated chronic health conditions, the option to analyze them differently, instead of using a global measurements (number of chronic conditions), aimed at verifying if the contribution for the event would be distinguished between them[25]. Among all of the variables describing the health conditions, only the inability to perform ADL and kidney failure did not remain independently associated with the absence of medical appointments, whereas cancer and depression stand out by the strength of association.

The absence of medical appointments was significantly less prevalent among the elders who presented both associated morbidities (AH and DM), when compared to elders with only one of them. The presence of these associated diseases implies higher risks of complications in the clinical picture[6]. It is also important to emphasize that BP control among hypertensive patients who present DM as comorbidity is harder due to the complexity of the clinical picture at the presence of these associated health conditions[32]. Therefore, hypertensive/diabetic elders, by being aware of the risks involved in the course of these conditions without medical follow-up, would see the doctor more often in order to try to control them.

This study presents some limitations. The main one regards the fact that the question used to measure the event lost in specificity, since it does not ask about the reason for the medical

appointment. In the study, the nonattendance to medical appointments constitutes a risk marker of the course of AH and DM, without the necessary medical follow-up. In case the medical appointment had been motivated by another health issue other than HA and/or DM, it is likely that these diseases have not been monitored, thus potentializing the occurrence of false-negatives for the event, and leading to the underestimation of its prevalence. However, it is reasonable to assume that every medical appointment, regardless of motivation, constitutes an opportunity to assess the general health status of the patient; then, the presence of these diseases can be detected, and, consequently, monitored. This would minimize the possible occurrence of information bias, because of the low discriminatory power of the question.

Another limitation concerns the criterion used to select the study population, which was based on the reference to the hypertensive and/or diabetic condition by the interviewee, based on history of medical diagnosis, and not on clinical measures, such as BP and blood sugar values, associated with the report of use of anti-hypertensive and hypoglycemic drugs. However, this procedure has been used in large health population surveys in other countries[32] and in Brazil[23], and this measure has been proven to be valid to identify the presence of chronic health conditions[33].

It is necessary to measure the high proportion of close acquaintances (another resident in the household or neighbor) in this study 928.1%). In the case of PNAD, close acquaintances are consulted not only in situations in which the participant is unable to answer the questionnaire due to a health condition, but also when this person is not in the household. In this study, the information from the acquaintance was considered in the data analysis as a confounding variable, at first, so not causing significant changes in results, except for the dilution in the strength of the detected associations. In case of any tendency caused by this information, it was not differential.

This study presents the typical advantages of all epidemiological studies that used data from PNAD and that come from methodological procedures of data collection in the Health Supplement, which is the largest health population survey conducted in Brazil. The sampling design allowed the selection of a study population that comprises the whole national territory and represents the Brazilian population. Add to that the sample size, which strengthens the statistical analyses and constitutes an additional advantage when the elderly segment of the population is approached, which is small, but very heterogeneous. The coverage of the variables considered in the questionnaire enables a deeper analysis, especially when it has an exploratory character, as was the intention of this investigation. It is the first national study that we know of that investigated this theme in an elderly population, which comprises hypertensive and/or diabetic elders.

CONCLUSION

To sum up, the results in this study corroborate classic associations between predisposing, enabling and health need characteristics and the use of health services — herein analyzed

based on medical appointments —, shown both in national and international studies. However, the possibility of inequality and inequity in the access to medical appointments calls the attention, based on associations verified for geographic regions and for the health insurance plan coverage. Such results indicate the challenge to plan and manage health care in Brazil, in terms of improving the surveillance of people with chronic diseases and establishing lines of care that contemplate their connection to health services and access to adequate therapy. It is also worth to mention that, given the national character of this investigation, new studies are necessary to verify if this situation is reproduced in different smaller geographic contexts, such as regional and municipal ones, especially if we consider the decentralizing aspect that should guide the planning and the offer of health services.

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