Does the previous diagnosis of arterial hypertension affect one´s daily life? Pró-Saúde Study

Conhecimento de diagnóstico prévio de hipertensão arterial tem impacto sobre o cotidiano do indivíduo? Estudo Pró-Saúde

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Abstract

In addition to damaging several target organs, arterial hypertension may negatively impact patients' activities of daily living. Biological and behavioral mechanisms underlying such limitations have yet to be clarified. The objectives of this study were to investigate whether having been previously told of a hypertension diagnosis is associated with the frequency and duration of temporary limitations in activities of daily living, and whether these relationships differ by gender, age, or socioeconomic position. We analyzed sectional data from 2,666 participants (56% women; 55% with high school or lower schooling) at the baseline phase (1999 – 2001) of a longitudinal investigation of university employees in Rio de Janeiro, Brazil (Pró-Saúde Study), asking participants whether they had ever been diagnosed with hypertension by a health professional, if they had been unable to perform any activities of daily living due to a health problem in the previous 2 weeks, and for how many days that had occurred. Multinomial logistic regression models were fitted for the overall study population and for age, gender, educational level, and per capita household income strata. Associations between hypertension diagnosis and temporary limitations were not observed in the overall study population and in gender, education and income strata. However, there were higher odds of temporary limitations among participants aged 55 years old or more with hypertension diagnosis (adjusted OR = 9.5; 95%CI 1.5 – 58.6), regardless of blood pressure levels and use of antihypertensive medication. Elderly people may keep an attitude of higher vigilance regarding conditions or events potentially worsening their health status.

Keywords: Hypertension. Illness behavior. Quality of life. Aging.

Resumo

Além de lesões em vários órgãos-alvo, a hipertensão arterial pode determinar outras consequências negativas no cotidiano do portador, mas os mecanismos biológicos e comportamentais possivelmente envolvidos ainda não foram esclarecidos. Os objetivos deste estudo foram investigar se o histórico autorrelatado de hipertensão associa-se com freqüência e duração de incapacidade temporária para atividades habituais, e se esta relação modifica-se de acordo com sexo, idade ou posição socioeconômica. Analisamos dados seccionais relativos a 2666 participantes (56% mulheres; 55% ensino médio ou menos) da linha de base (1999-2001) de uma investigação longitudinal de funcionários de universidade no Rio de Janeiro (Estudo Pró-Saúde): se o indivíduo alguma vez havia sido informado por profissional de saúde que tinha hipertensão, se nas duas semanas anteriores havia ficado impedido de realizar alguma de suas atividades habituais por problema de saúde, e por quantos dias isso ocorrera. Modelos de regressão logística multinomial foram utilizados para a população total e em estratos de sexo, idade, renda e escolaridade. Não observamos associação entre histórico autorrelatado de hipertensão e ocorrência de incapacidade temporária na população total e em estratos de sexo, escolaridade e renda. Entretanto, essa associação foi evidenciada entre os participantes com 55 ou mais anos de idade (OR ajustada = 9,5; IC95% 1,5 – 58,6), independentemente dos níveis de pressão arterial e do uso de medicação anti-hipertensiva, o que pode expressar uma atitude de maior vigilância desses indivíduos mais idosos em relação a sintomas que possam representar piora de seu estado de saúde.

Palavras-chave: Hipertensão. Comportamento de doença. Qualidade de vida. Envelhecimento.

Introduction

Arterial hypertension (AH) plays a completely recognized role in the genesis of health conditions resulting from target organ injuries, with great individual and collective impact, such as the coronary disease, stroke and chronic kidney disease[1]. The condition has other possible consequences, with potential repercussion in the daily life of the patient. Besides the possibility of clinical symptoms directly related to high blood pressure (BP) values, the use of pharmacological antihypertensive therapy can worsen the quality of life of the user[2] due to the effects induced by the used drugs.

Another mechanism that can cause the patient with AH to suffer repercussions in activities of daily living is the adoption of specific behaviors or different perceptions about health status, simply due to the fact that this patient is aware of having this condition. Among these behaviors, it is possible to mention: amplification of symptoms, missing work days, deterioration of social relations, and more frequent use of health services[3]. The first study designed specifically to approach this phenomenon in relation to AH was conducted by Haynes et al.[4], who observed an 80% increase in missed work days among workers who had been diagnosed with hypertension in a tracking program, without relating it to drug therapy or BP levels. In a study that analyzed quality of life, Mena-Martin et al.[5] observed better scores of general health perception, functional capacity, vitality and mental health among normotensive individuals in comparison to hypertensive ones who were aware of their condition, but there was no difference in these parameters between normotensive individuals and hypertensive ones who were not aware of the disease.

There are few studies analyzing if the consequences of being aware of the condition are homogeneous in the several sociodemographic population strata. The reactions of the individuals to the presence of physical symptoms or to the fact of perceiving themselves as being sick can be influenced, for instance,

by attributes such as gender[6], age and socioeconomic position. Older people, in response to acute or chronic physical conditions, can become more vigilant as to the observation of changes in their health status[7]. Barger and Muldoon[8] used data from the National Health and Nutrition Examination Survey (NHANES) and found a relationship between the awareness of AH and the worst self-reported health among participants of NHANES, however, they did not detect effective changes according to gender or ethnical group.

In Brazil, it was not possible to locate studies addressed to this phenomenon specifically in literature. One analysis conducted in São Pauo identified behaviors and reactions in individuals after being diagnosed with AH, which ranged from absence of changes in life until the feeling of "a tragedy... too much suffering... I can no longer do what I used to do"[9]. Firmo et al.[10] investigated how elderly people classified as hypertensive thought and identified that "generally, interviewees say that the fact of having a blood pressure condition does not bring major disturbances into their lives"; however, many participants mentioned they were obliged to change their routine since they are not able to perform their daily living activities "when the pressure goes up".

The temporary inability to perform activities of daily living, defined as a temporary restriction in the usual functional capacity of the individual[11], is health status indicator recommended by the World Health Organization (WHO) for population studies, and it can be useful to assess the impact of a disease or condition on the daily life of a person. It can be analyzed with regard to different periods of time, but it is recommended that it does not make reference to more than two weeks earlier, since it is possible that the person cannot remember an episode that took place many days ago[11]. ITAH has been used in our context for investigations about health conditions in the National Household Sample Survey (PNAD), and it can be considered as a broader health indicator. The number of days with restricted activities is considered to be an important measure for the individual's functional state and well-being[12]. The compromise of activities of daily living due to health problems is a more prominent indicator of quality of life tan specific diseases[13]. Considering the other possible mechanisms mediating consequences of AH in the daily life of a patient, we observed the association between the use of antihypertensive medication and the occurrence of temporary incapacity for 8 to 14 days in a previous study[14], probably because of the adverse effect of the drugs. On the other hand, we observed an inverse association between the reported systolic BP value and the occurrence of ITAH for a seven day period, and we possibly attributed this finding to a hypoalgesia mechanism associated to AH[15,16].

In this study, we investigated if the self-reported history referring to the previous diagnosis of AH is associated with the frequency and the duration of temporary incapacity for usual activities, and if this relationship changes according to gender, age or socioeconomic position.

Methods

Study design and population

We analyzed data from the Pró-Saúde Study, a longitudinal investigation of technical and administrative staff of a university located in the state of Rio de Janeiro. The target population was identified by the combination of lists provided by the human resources department of the institution, by the sector in charge of payroll and directly by their units and sectors. Employees conceded to other institutions and on leave for reasons unrelated to health were excluded. The whole data collection process was conducted by trained teams of researchers, supervisors and field coordinators. Every day, questionnaires were revised and double-typed independently.

In our sectional study, we used data concerning the employees who participated in the first two stages of data collection (1999 and 2001). Out of the 4,177 eligible workers to participate in the cohort, we obtained information

about 3,253 employees. After the exclusion of two workers aged more than 80 years old and of participants with missing or inconsistent data with regard to having received a prior diagnosis of AH or about ITAH, our study population consisted of 2,666 participants (63.8% of the eligible ones).

Measures

The previous diagnosis of AH, our exposure variable, was assessed by the following questions: "Has a DOCTOR or another HEALTH PROFESSIONAL ever informed you had or have hypertension, that is, high blood pressure?". The response options were: "no"; "yes, only once" and "yes, more than once", whose participants were grouped together; and "yes, only during pregnancy", whose individuals were excluded from the study population. A test-retest reliability assessment of this information was obtained in an additional study to this investigation, conducted in 1999 with 192 participants[17], which estimated a 0.75 kappa coefficient (95%CI 0.73 – 0.77) after the repetition of the questionnaire with a two-week interval.

As outcome, the occurrence and the duration of temporary incapacity episodes to perform usual activities in the 14 previous days were considered. This information was obtained by the questions: "In the PAST TWO WEEKS, were you prevented from doing any of your usual activities (for instance, work, leisure or household chores) because of a health condition you had or have?". The participants who reported temporary incapacity were then asked: "In the PAST TWO WEEKS, for HOW MANY DAYS, in total, were you prevented from doing any of your usual activities (for instance, work, study, leisure or household chores) due to this or these health problem(s) you have or had?". A test-retest reliability study of the questionnaire was conducted with 94 employees who were not hired by the university. The result of this study estimated the reliability of the response about the non-interruption of usual activities in 0.73 (95%CI 0.71 – 0.75) (kappa coefficient). Based on the observed distribution, our outcome variable was built with the categorization of the participants in three strata: those who did not report incapacity, the ones who reported it for up to 7 days, and the ones who reported incapacity between 8 and 14 days.

Some variables were considered as potential confusion factors. Age, body mass index (BMI, in kg/m^2), measured systolic and diastolic BP value at the time of data collection and per capita household income (in the minimum wages at the time) were treated as continuous variables, and we applied a logarithmic transformation to the latter, since its distribution presented great asymmetry to the right. Specifically concerning the measurement of BP, field researchers were trained by a material produced by the British Medical Journal[18]. Several strategies were used for the quality control of BP measures: observation of field measurements by 2 supervisors, randomly, approaching all of the measurers; maintenance of the equipment used for measurements; monthly evaluation of BP reports with individual records of measurers, in order to look for the occurrence of bias in digital terminals; fortnightly assessment of the proportion of missing data and identical BP measures.

Categorical variables were: gender; presence of comorbidities (participants who declared to have been informed by a doctor to have "diabetes" and/or "high cholesterol" were considered as a person with comorbidity); the use of antihypertensive medication and schooling, with three categories of stratification: participants with complete elementary school, complete high school and with a college degree.

Statistical procedure

After the descriptive data evaluation, we conducted an initial bivariate analysis between exposure and outcome. Afterwards, we performed a multivariate analysis by means of a multinomial logistic regression to evaluate the influence of potential confusion factors, by using the odds ratio to measure the magnitude

of the association. The use of this model was based on the absence of intrinsic ordering between the outcome categories[19].

Regression models were conducted at first in the study population as a whole, involving all of the mentioned co-variables, and afterwards in the gender, age, per capita household income and schooling strata. Since the population did not present a large number of older individuals, we divided the participants into two groups: those aged until 54 years old, and from 55 years old on. Concerning the per capita income, participants were grouped in: less than 3, between 3 and 6, or more than 6 minimum wages at the time. With regard to schooling, strata were defined by: participants with complete elementary school, those with complete high school and the ones with college degree or more. In the subgroups of gender, per capita household income and schooling, models exclude only the co-variable whose strata were under investigation, while in the different age groups age was maintained as a co-variable in the model, as a strategy against residual confusion.

All of the regression procedures were conducted only with observations that did not present absent values in none of the co-variables, and the mentioned analyses were repeated after the interviewees who reported a previous diagnosis of myocardial infarction (MI), angina or stroke were excluded. The statistical procedures were conducted with the software Stata 9.1.

These protocols were submitted and approved by the Research Ethics Committee of the university where the study was conducted. Participants were informed about the Pró-Saúde Study and its objectives and signed the informed consent form.

Results

Table 1 shows the distribution of co-variables among the 2,666 participants, with small prevalence of female participants, the group with per capita household income of up to 3 minimum wages and individuals with higher schooling. The frequencies of previous diagnosis of comorbidities (diabetes mellitus or dyslipidemia) and angina, MI or stroke are in the same table. The mean age of participants was of 41.6 years old (ranging from 24 and 69 years old), and 196 individuals were 55 years old or more (7.4%). BMI ranged from 15 and 64, with mean of 26.2 (data not shown in the table).

Table 1 - Demographic, socioeconomic and clinical characteristics of participants. Pró-Saúde Study 1999 – 2001.

Tabela 1 - *Características demográficas, socioeconômicas e clínicas dos participantes. Estudo Pró-Saúde 1999 – 2001.*

Characteristics	n (%)
Sex (n = 2666)	
Male	1187 (44.5)
Female	1479 (55.5)
Per capita household income (in minimum wages) (n = 2573)	
< 3	942 (36.6)
3 – 6	861 (33.5)
> 6	770 (29.9)
Schooling (n = 2620)	
Elementary school or less	525 (20.0)
High school	921 (35.2)
Higher education or more	1174 (44.8)
Presence of comorbidities (n = 2619)	670 (25.6)
Use of antihypertensive medication (n = 2666)	435 (16.3)
Previous history of angina, MI or stroke (n = 2666)	83 (3.1)

The total number of participants differs among variables because of missing data. MI: myocardial infarction.
Os números totais diferem entre as variáveis em função da existência de dados faltantes. MI: infarto do miocárdio.

The mean value of systolic pressure was 116.8, and 73.5 mmHg for diastolic pressure.

In this population, 828 individuals (31.1%) had already been informed about having AH by health professionals. Temporary incapacity for usual activities in the 2 previous weeks was reported by 623 participants (23.4%), with mean duration of 2.9 days and median of 2 days. Among those who reported time of incapacity, it lasted up to 7 days in 488 cases (83%), and for 99 participants (16.9%), from 8 to 14 days.

Table 2 shows the proportion of participants who reported ITAH in the subgroups of individuals who had been diagnosed with AH or not. In both groups it is possible to observe great prevalence of participants who did not report ITAH, and a small proportion of individuals reporting ITAH for more than 7 days.

In the regression analysis, considering the adjusted odds ratio for the co-variables, no association was observed between the awareness of a previous diagnosis of AH and the occurrence of ITAH, be it in the general population, among men and women, or in the strata of per capita household income and schooling (Table 3). There was an effect modification according to age group: in individuals aged more than 54 years old, we observed more chances of ITAH among participants who had been diagnosed with AP, with adjusted odds ratio of 9.5 (Table 3).

Results remained practically unaltered when analyses were repeated with the exclusion of individuals who reported previous angina, MI or stroke (data not shown).

Discussion

After the adjustment for gender, age, per capita household income, schooling, BMI, systolic and diastolic BP, report of comorbidities and use of antihypertensive medication, our results do not suggest the presence of association between the previous diagnosis of AH and the occurrence of temporary incapacity for usual activities in almost all of the studied groups (total population, men and women, different levels of per capita income and schooling) and in the two assessed periods of duration of incapacity (up to 7 days, and 8 to 14 days). However, among individuals aged more than 54 years old, the association between previous information of AH and ITAH up to 7 days presented a remarkable and statistically significant magnitude, even after the adjustment by the described variables (OR = 9.50).

ITAH can be seen as a specific modality of the so called illness behavior[20]. This concept comes from the early descriptions by Sigerist (1929) about the "special position of the sick person", and especially from the theoretical construction of Talcott Parsons (1951) about the "sick role"[21], in which specific attitudes and wishes considered to be socially adequate for a person who is seen as being sick are described[22]. Mechanic and Volkart first used the term illness behavior in 1961[23], in order to approach the great variability of reactions in relation to the presence of symptoms or the perception of the disease, and to identify social, cultural, environmental and psychological components that could influence these reactions[21]. This conceptual elaboration indicates a change in focus: from a global "macro-sociological" analysis, it begins to focus on behaviors of specific social groups[20]. Afterwards, Mechanic defines the sick behavior more broadly, as the "several forms in which individuals react to physical symptoms, how they monitor their

Table 2 - Proportion (%) of participants reporting temporary limitations, according to previous awareness of hypertension diagnosis. Pró-Saúde Study 1999 – 2001 (n = 2666).
Tabela 2 - *Proporção (%) de participantes que relatou incapacidade temporária, de acordo com conhecimento prévio de diagnóstico de hipertensão arterial. Estudo Pró-Saúde 1999 – 2001 (n = 2666).*

Previous AH diagnosis	Temporary disability within 14 days		
	No incapacity	Up to 7 days	8 a 14 dias
No	79.2	17.8	3.0
Yes	74.4	20.0	5.4

Table 3 - Crude and adjusted odds ratio for temporary limitations in daily living activities among participants with previous awareness of hypertension diagnosis, by gender, age, household income per capita and education.
Tabela 3 - *Odds ratio brutas e ajustadas para incapacidade temporária para atividades habituais entre participantes com conhecimento prévio de diagnóstico de hipertensão, segundo sexo, idade, renda domiciliar per capita e escolaridade.*

Strata	Crude OR (95%CI)		Adjusted OR (95%CI)	
	UP to 7 days	8 – 14 days	Up to 7 days	8 – 14 days
Total population*	1.19 (0.95 – 1.49)	1.77 (1.15 – 2.71)	1.31 (0.95 – 1.81)	0.81 (0.41 – 1.61)
Gender**				
Men	0.98 (0.67 – 1.43)	1.63 (0.83 – 3.20)	1.24 (0.77 – 2.01)	0.88 (0.35 – 2.24)
Women	1.31 (0.99 – 1.72)	1.86 (1.07 – 3.24)	1.40 (0.91 – 2.18)	0.75 (0.28 – 2.05)
Age*				
< 55 years old	1.15 (0.91 – 1.46)	1.73 (1.10 – 2.72)	1.19 (0.85 – 1.66)	0.80 (0.39 – 1.64)
≥ 55 years old	7.33 (1.65 – 32.69)	2.20 (0.43 – 1.32)	9.50 (1.54 – 8.63)	0.93 (0.09 – 10.12)
Per capita household income***				
< 3 MW	1.18 (0.84 – 1.67)	1.36 (0.76 – 2.42)	1.29 (0.80 – 2.09)	1.09 (0.46 – 2.59)
3 – 6 MW	1.18 (0.81 – 1.73)	3.10 (1.32 – 7.32)	1.59 (0.91 – 2.78)	0.63 (0.14 – 2.83)
> 6 MW	1.11 (0.70 – 1.77)	0.94 (0.31 – 2.89)	0.92 (0.46 – 1.84)	0.72 (0.13 – 3.99)
Schooling				
Elementary school or less	1.45 (0.88 – 2.40)	1.42 (0.64 – 3.15)	1.64 (0.84 – 3.21)	0.69 (0.20 – 2.40)
High school	1.03 (0.72 – 1.48)	1.55 (0.80 – 3.01)	1.05 (0.63 – 1.75)	0.98 (0.36 – 2.68)
Higher education or more	1.28 (0.88 – 1.85)	1.32 (0.52 – 3.36)	1.41 (0.82 – 2.44)	0.69 (1.51 – 3.17)

Reference category: individuals without previous awareness of hypertension diagnosis.
*Adjusted for gender, age, household income per capita, educational level, body mass index, systolic and diastolic blood pressure, report of comorbidities and use of anti-hipertensive drugs. **Same, except gender. ***Same, except household income per capita. ****Same, except educational level.
MW: minimum wage.
Categoria de referência: indivíduos sem conhecimento prévio de diagnóstico de hipertensão arterial.
**Ajustadas por sexo, idade, renda domiciliar per capita, escolaridade, IMC, PA sistólica e diastólica, relato de comorbidades e uso de medicação anti-hipertensiva.*
***idem, exceto sexo. ***idem, exceto renda domiciliar per capita. ****idem, exceto escolaridade. MW: salário mínimo.*

internal status, define and interpret symptoms, attributing values to them, adopting attitudes with therapeutic objective, and looking for formal or informal health care"[21].

From this amplification of the conceptual field, it is possible to find several investigations approaching different modalities of illness behavior and their determinants. Young mentions examples of different behaviors associated with ethnical and cultural factors: in New York, individuals descending from Italians expressed more concern in response to painful symptoms, while those descending from the Irish were more optimistic and satisfied in their relationship with the assisting doctor[24]. By assessing patients with celiac disease in the remission period, Rosa et al. detected attitudes considered to be of disproportional fear in relation to the disease in 24% of the individuals[25].

Other studies observed changes in behavior and in valorization of the symptoms among individuals diagnosed with AH. Mold et al. observed that the estimated time by the patients to recover their health status from a high respiratory infection was practically twice as high among hypertensive individuals when compared to normotensive people[26]. Bloom e Monterossa observed that patients who had claimed to be hypertensive, and, however, after a new assessment presented with normal pressure values with no specific treatment, reported more depressive symptoms and worse health perception than normotensive people[27]. Leynen et al. observed more missed work days among hypertensive or dyslipidemic individuals who were aware of having these conditions when compared to unaware workers[28].

There was no association between the awareness of a previous AH diagnosis and the occurrence of ITAH in the group of our study population. It is possible to speculate that the studied population, for some specific demographic characteristic, would not be prone to adopting such behavior. It could be assumed that specific individuals would have the tendency to underestimate or voluntarily omit the occurrence of temporary incapacity, since the information was collected in the work environment. Even if it is not possible to completely rule out the aforementioned situations, we believe its occurrence was very rare because of the emphasis manifested by the collection teams as to data secrecy, the explanation in the question that it was about any of the usual activities of the interviewee, and because of a certain "dilution" effect, since the question was in the middle of the questionnaire together with other data without a direct relation with this one. Another possibility is that this specific modality of illness behavior is not commonly adopted by the individuals. We cannot confirm or refuse this hypothesis, since this outcome (ITAH) was mostly used in previous investigations as a health indicator, and not in the context of investigating illness behavior. Finally, we can speculate as to the lack of a direct correspondence between the fact that the individual had already been informed about the AH but, finally, really considering to have this condition. It is possible that part of the interviewees who had already received this information took it for granted, and did not see themselves as hypertensive patients, which would make their perceptions and actions similar to those of someone who did not receive such information.

We did not observed the influence of gender in the relationship between being aware of a previous AH diagnosis and the occurrence of ITAH. The difference between genders when it comes to the reaction to the presence of feelings possibly interpreted as symptoms or diseases is remarkable. Adult women tend to report physical symptoms more often and more intensively than men[29], and they also look for health care services more often[30]. Banegas et al. observed that the fact of being aware of the hypertensive condition among women was associated with reduced quality of life in several dimensions; among men, such fact was detected in fewer domains[31]. However, this more frequent perception of symptoms does not necessarily translate into the more frequent adoption of some modalities of illness behavior. In the investigation by Van Wijk et al.[6], women reported physical symptoms more often and more intensively than men; however, there was no difference between genders as to the restriction of activities and use of medications. On the other hand, Reis et al.[32] detected more proportion of short term work leave among women, in a sample of nurse professionals. It is important to notice that the aforementioned studies approach outcomes that can even be characterized as illness behavior, but they have differences in relation to each other.

We did not detect differences in the association between being aware of the previous AH diagnosis and the occurrence of ITAH in the different socioeconomic strata. Once our study is basically exploratory, we chose

to use one more indicator (schooling and per capita household income) in order to reach different dimensions from that construct[33], which could change the relation investigated through different paths. The direct association between ITAH and the worse socioeconomic condition has been observed in our field by some investigations[13,34]. However, we did not find other studies specifying the occurrence of ITAH according to social condition associated with other factors. By approaching outcomes that were somehow similar, Alexopoulos et al. observed that the low schooling was associated with a higher rate of absence at work among individuals with low back pain[35]. On the other hand, in the work by Barger and Muldoon[8], the relationship between the awareness of AH and self-reported health did not change according to ethnical group (white, black or Hispanic). In the most detailed analysis by Boltanski about the somatic culture in different social classes, the author describes how the interest and the attention conceived by the individuals to their own bodies increase when they rise in social class[36]. Therefore, poorer individuals would tend to use the body mostly as an "instrument" of "maximum use", adopting more resistant actions to perceptions that would lead to the abandonment of daily tasks; it is as if these individuals, to quote the author, "accepted the sick roll less easily".

There are two factors that implicate prudence with regard to the generalization of our results in relation to socioeconomic position, and both are related to the characteristics of the researched population. Since it is composed of employees hired in a university, there are certainly not individuals from the whole spectrum of social strata, particularly very poor ones. Besides, since they worked in a specific institution, their relationship with work, and possibly with other aspects of life, can be filled with peculiarities, thus compromising their representativeness in relation to other population groups.

In our study, a strong association has been detected between previous awareness of the AH diagnosis and incapacity for up to 7 days only in the population aged 55 years old or more. This mean age of this group is of 59 years old, being 33.5% male participants, and with 8.1% of them reporting previous angina, MI or stroke. With regard to the main study variables, 64.4% of them had already been informed about having AH by health professionals, and temporary incapacity was reported by 22.3% of the participants. This finding is different from the result observed in the only study we found focused on this specific question. In the investigation by Firmo et al., the association found in the bivariate analysis between the awareness of the hypertensive condition and the occurrence of temporary incapacity in a population aged ≥ 60 years old or more was not confirmed after the adjustment for confusion variables[37]. Some factors may have contributed with this difference. Our study, unlike the mentioned one, used not only the fact of temporary incapacity, but also the time of incapacity. We used this approach due to the previous work that suggested that different incapacity times can be related to several factors[14], therefore increasing the specificity of our outcome.

Besides, there are important differences between the populations in the two studies. In our case, it is population who works and lives in a large city, while the study by Firmo et al. uses a population-based cohort from a small city in the state of Minas Gerais; there, possibly a significant part of the participants no longer works. Considering that the illness behavior globally suffers major influence from sociocultural factors, it is possible that these different population profiles justify the different results that were found. For example, we can speculate that an economically active population performs more daily activities, therefore, being more susceptible to not being able to conduct any of these activities.

It is possible that the higher occurrence of ITAH in workers aged more than 54 years old who had been diagnosed with AH is the expression of more attitudes of

sensitivity and vigilance of these individuals in relation to changes that can represent the worsening of their health conditions[7]. In the process of adjustment to a new condition, one factor considered to be relevant for the motivation to adopt a specific behavior is the perception of more susceptibility[38]. Due to the known changes in the physical condition at this age group, and the higher probability to develop health in general, it is possible that these individuals adopt such behavioral pattern in response to information that is interpreted as a threat to health more frequently than younger people. An alternative explanation could be based on the occurrence of ITAH in relation to target organ injuries, because most of these individuals possibly have had AH for much longer than younger people. However, the results were basically the same when the analyses were conducted after the exclusion of the participants who reported previous history of angina, MI or stroke.

Generally, our results are inconsistent with those by Taimela et al., who observed lower probability of missing work among individuals aged more than 45 years old when compared to those younger than 40 years old[39]. However, Adamson et al. observed that the tendency to look for health care because of thoracic pain, especially among women, increased with age[40], which can be interpreted as a similar attitude to that approached in our investigation.

As in the situation when the awareness of having AH cannot lead individuals to be considered as effectively hypertensive, it is necessary to emphasize the possibly ambiguous relationship between the aforementioned data and the use of hypertensive medication. We can speculate that those individuals who use this therapy are more prone to really considering themselves as hypertensive, and, therefore, to adopting specific behaviors because of that. Since the use of medication showed association with ITAH from 8 to 14 days[14] in another investigation, its inclusion was mandatory in the statistical analysis as a possible confusion variable. However, this procedure can have led to a hyper-adjustment, which on the one hand may have attenuated the association researched in the population as a whole or in some subgroups, but on the other, turns the association found in the subgroup aged more than 54 years old even more robust.

Final considerations

We characterized ITAH as a modality of illness behavior, both with the objective of contextualizing it inside a broad spectrum of reactions of individuals in relation to the health-disease question, and so we can confront our findings with other data from literature. From another point of view, we emphasize that ITAH is important, since it is a relevant indicator of health and quality of life. We understand that the simple fact of an individual being diagnosed with a specific condition, in this case, AH, may lead to consequences in his or her routine. The assessment of this process cannot only contribute with the better understanding of a broad spectrum of human reactions to the sickening process, and enable that the care to the individual who looks for health care includes more adequate orientations, with positive repercussion in on health status, especially if we consider the higher vulnerability of elderly people, among which we detected the possible consequence of mere information. Further investigations about the subject should contemplate, additionally, the reported causes of temporary incapacity.

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