

Recommendations and practice of healthy behaviors among patients with diagnosis and diabetes in Brazil: National Health Survey (PNS), 2013

Recomendações e práticas dos comportamentos saudáveis entre indivíduos com diagnóstico de hipertensão arterial e diabetes no Brasil: Pesquisa Nacional de Saúde (PNS), 2013

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ABSTRACT: *Objective:* To analyze healthy life style recommendations given in health care and the adoption of healthy behaviors among hypertension and diabetes patients. *Methods:* We analyzed the recommendations according to the place of the last health care visit (primary health care, other public facilities, and private health care facilities). The effects of having a diagnosis of hypertension or diabetes on the adoption of healthy practices were analyzed by multivariate logistic regression models, using sex, age, and educational level as control variables, and the following outcomes: current use of tobacco products; regular physical activity during leisure time; recommended intake of fruits and vegetables; perception of low salt intake; frequent consumption of sweets; and excessive alcohol consumption. *Results:* Approximately 88% of hypertension patients received recommendations to have a healthy diet, 91% to eat less salt, 83% to practice regular physical activity, and 76% to not to smoke. Among diabetic patients, all recommendations related to nutrition were very frequent, reaching 95% for the habit of having fruits and vegetables regularly. The effect of having a diagnosis of hypertension was significant for non-use of tobacco products and perception of low salt intake. The diagnosis of diabetes mainly influenced the habit of not consuming sweets often. *Conclusion:* Results evidenced that people with diagnosis of hypertension and diabetes give priority to not use (stop) harmful health behaviors than to adopt practices that will bring benefits to their health. It is necessary to promote not only the adverse effects of harmful habits, but also the benefits of healthy behaviors to aging well.

Keywords: Hypertension. Diabetes Mellitus. Primary health care. Healthy behaviors. Health promotion. Brazil

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Conflict of interests: nothing to declare – **Financial support:** none.

RESUMO: *Objetivo:* Analisar as recomendações relacionadas aos comportamentos saudáveis e a adoção das práticas recomendadas entre indivíduos hipertensos e diabéticos. *Métodos:* Foram analisadas recomendações relacionadas aos comportamentos saudáveis segundo local do último atendimento (atenção básica; outros estabelecimentos públicos; estabelecimentos do setor privado). Os efeitos de ter um diagnóstico de hipertensão ou diabetes sobre a adoção das práticas recomendadas foram analisados por modelos de regressão logística multivariada, usando sexo, idade, e grau de escolaridade como variáveis de controle, e os seguintes desfechos: uso atual de produtos de tabaco; prática regular de atividade física no lazer; consumo recomendado de hortaliças e frutas; percepção de baixo consumo de sal; consumo frequente de doces; consumo excessivo de álcool. *Resultados:* Aproximadamente, 88% dos hipertensos receberam recomendações de ter uma alimentação saudável, 91% de ingerir menos sal, 83% de praticar atividade física regular, e 76% de não fumar. Entre os diabéticos, todas as recomendações relacionadas à alimentação foram muito frequentes, 95% para o hábito de ter uma alimentação com frutas e hortaliças. O efeito de ter um diagnóstico de hipertensão foi significativo para o não uso de produtos de tabaco e percepção de baixo consumo de sal. O diagnóstico de diabetes influenciou principalmente o hábito de não consumir doces frequentemente. *Conclusão:* Evidenciou-se que os hipertensos e diabéticos dão prioridade a não usar hábitos nocivos à saúde do que adotar práticas que lhe trarão benefícios. É preciso promover não só os efeitos adversos dos hábitos nocivos, mas também os benefícios dos comportamentos saudáveis para o envelhecimento com qualidade. *Palavras-chave:* Hipertensão. Diabetes Mellitus. Atenção primária à saúde. Comportamentos saudáveis. Promoção da saúde. Brasil.

INTRODUCTION

With the aging of the world population¹ and the changes in morbidity and mortality profile, chronic noncommunicable diseases (NCDs) are now a major prevalent health problem in most countries, with a substantial portion of total disease burden attributed to the occurrence of chronic diseases among people who are 60 years old or older². From 1990 to 2010, while deaths by infectious diseases and infant mortality decreased considerably, deaths by NCDs increased, and, in 2010, they corresponded to two of every three deaths worldwide³.

In Brazil, the NCDs have been corresponding, equally, for an elevated number of deaths before 70 years of age and the loss of quality of life, resulting in disabilities and high levels of limitation of sick people in their work and leisure activities⁴. National studies pointed out that NCDs are responsible for over 70% of deaths⁵ and for high prevalence in the elderly population⁶. Results of the study of disease burden in Brazil showed, equally, the great proportion of years of life lost by premature death due to NCDs⁷.

However, the risk of developing a chronic NCD may be significantly reduced by adopting healthy behaviors, such as practicing physical activities, having a healthy diet, abstaining from tobacco, and avoiding the abusive consumption of alcohol⁸⁻¹⁰. In the international context, some strategies were established in order to improve the health of populations and increase the quality of life for elderly¹¹. Besides promoting healthy behaviors among all age ranges in

order to prevent or delay the onset of NCDs, it is essential, also, to reduce the consequence of chronic diseases through their early detection and the provision of quality care^{12,13}.

In Brazil, the implementation of the Unified Health System (*Sistema Único de Saúde – SUS*) in the 1990s represented an important change in the pattern of the organization of health services in the country, especially with the strengthening of primary health care¹⁴. With the implementation of the Family Health Program (*Programa de Saúde da Família – PSF*), it was established a geographic direction for the attention given by health teams to families in socially disadvantaged areas and populational groups¹⁵. The Strategy of Family Health (*Estratégia de Saúde da Família*) is, nowadays, considered to be the main gateway to the health system¹⁶.

Among the main responsibilities of primary care are the control of hypertension and diabetes. However, the actions promoting health were implemented into primary care only in 2006. When recognizing the preponderant action of the determinants on health and quality of life conditions, the National Policy of Health Promotion (*Política Nacional de Promoção da Saúde – PNPS*) was introduced in the middle of the past decade and represents a milestone in the consolidation of the health system¹⁷. Among the priority of actions are the aspects related to chronic non-NCDs, such as the recommendations for a healthy diet, practicing physical activities, as well as quitting smoking and alcohol abuse¹⁸.

Using the data from the National Health Research (*Pesquisa Nacional de Saúde - PNS*) from 2013, the objective of this study is to analyze the data of recommendations to the individuals with hypertension and diabetes in health care for these reasons, and to investigate whether the recommendations related to lifestyles are being followed by these individuals.

METHODS

The National Health Research (*Pesquisa Nacional de Saúde – PNS*) is a national home-based research, held in partnership with the Ministry of Health, the Oswaldo Cruz Foundation, and the Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística – IBGE*). The project was approved by the National Research Ethics Commission (*Comissão Nacional de Ética em Pesquisa – CONEP*) in June 2013. Field work was conducted between August 2013 and February 2014.

The PNS is part of the Integrates System of Household Surveys from IBEG and, therefore, uses a subsample of the Master Sample of IBGE¹⁹, with the same stratification of primary selections units (UPAs), consisting of one or more census sectors. The sample plan of PNS was by clusters in three selection stages (UPAs, household, adult resident). In all stages, a simple random sample was used as the selection method. In total, 60,202 interviews were conducted with the adults selected in the household.

In relation to the NCDs, the individuals who reported medical diagnosis of hypertension and diabetes were analyzed. Among these, the location of the last care service was analyzed, referred to as: primary care (primary care unit, in the household with

a doctor from the family health team (ESF); other public facilities (expertise centers, public polyclinics, public emergency care units, ambulatories, and public hospitals); and private-sector institutions.

In order to research the recommendations made to the individual diagnosed with hypertension and diabetes and who had some kind of medical care by these reasons, there were analyzed, respectively, the following matters: “In any of the services for hypertension, has any doctor or other health professional given you any of these recommendations?” and “In any of the services for diabetes, has any doctor or other health professional given you these recommendations?” Among the individuals with hypertension diagnosis, the recommendations related to healthy behaviors were keeping a healthy diet (with fruit and vegetables); maintaining proper weight; ingesting less salt; practicing physical activities regularly; and not smoking in excess. Among diabetic patients, we replaced “ingesting less salt” by “reducing the consumption of carbohydrates.” The proportions of recommendations received by hypertension and diabetes patients were compared by local care.

For the analysis of healthy behaviors, the following habits were considered: smoking (uses/does not use any tobacco product at present); physical activity for leisure (practices/does not practice any physical activity for leisure in the recommended level – 150 minutes or more in light/moderate physical activities or 75 minutes or more in vigorous physical activities a week); recommended intake of vegetable and fruit (eats/does not eat vegetable and fruit at least five times a day); perception of very low/low salt intake (refers to very low/low intake of salt); frequent intake of sweets (eats/does not eat sweets in 5 days a week or more); and excessive alcohol consumption (drinks/does not drink alcohol in excess – 15 shots or more among men and 8 shots or more among women per week).

With the objective of investigating the practice of healthy behaviors among individuals with hypertension and diabetes, models of multivariate logistic regression were used, with the following possible answers:

1. currently uses some kind of tobacco product;
2. practices physical activities for leisure at the recommended level;
3. eats five or more servings of vegetable and fruit a day; and
4. drinks alcohol in excess.

For patients with hypertension, the recommendation included the perception of low/very low intake of salt, and for the diabetic ones, the recommendation included the frequent intake of sweets. With each one of the outcomes, we investigated the effects of having a hypertension diagnosis and a diabetes one, controlled by gender, age, and education level.

RESULTS

In the National Health Survey, 21.4% of the interviewed individuals reported medical diagnosis of hypertension and 6.2% of diabetes.

Among the individuals who had health care due to hypertension, 46.8% of them had their last care in primary care units or by the doctor of the health team in their households; 21.9% in other public facilities; and 31.3% in private institutions. A similar pattern was found among the individuals with diabetes, with the following percentages: 48.3, 18.8, and 32.9%, respectively.

The proportions of individuals diagnosed with hypertension who had medical care due to the disease had recommendations regarding healthy behaviors according to the place they were taken care of are presented in Table 1. Approximately, 88% of hypertension patients received recommendations of having a healthy diet, 85% maintaining proper weight, 91% ingesting less salt, 83% practicing physical activities regularly, 76% not smoking, and 75% not drinking in excess. The percentage frequencies of all recommendations related to healthy behaviors were slightly higher in private institutions, when compared to the care given in primary health care units, while the lowest percentages were found for the care given in other public establishments.

In Table 2, the proportions of recommendations related to healthy behaviors among individuals who received health care for diabetes are presented. The proportion of diabetics who had recommendations on keeping a healthy diet was 95%, reaching out to 96% in consultations in primary care units. Likewise, maintaining proper weight (92%) and reducing the intake of carbohydrates (88%) were often recommended, with slightly higher proportions in services of primary care rather than in the care given out in private consultations. In the order of magnitude of frequency and recommendations, the practice of regular physical activity (84%), not smoking (78%), and not drinking in excess (78%) were followed, and the percentages that meet these recommendations were slightly higher in private care.

Table 1. Proportion (%) of individuals who have received recommendations related to healthy behaviors according to place of last health care for hypertension. National Health Survey, Brazil, 2013.

Recomendation	Place of the last consultation			
	Primary Care	Other Public	Private	Total
Keeping a healthy diet (with fruit and vegetable)	87.2	84.2	93.0	88.4
Keeping appropriate weight	84.2	78.3	90.0	84.7
Ingesting less salt	91.2	87.8	93.3	91.1
Practicing regular physical activity	80.0	76.2	88.3	81.8
Not smoking	75.4	72.2	80.1	76.2
Not drinking in excess	75.2	70.4	79.0	75.3
Size of the sample*	5.366	2.504	3.585	11.455

*Number of individuals diagnosed with hypertension and who had at least one medical care for hypertension.

The results of the multivariate logistic regression which investigated the effects of having hypertension diagnosis on the practice of healthy behaviors are presented in Table 3. The models were used in the total sample of the PNS (60,202 individuals). As for the outcome “current use of tobacco”, the statistically significant effects, positive for low education levels, and negative for gender, indicate that the most frequent use of tobacco products is among male, less educated, individual. On the other hand, the negative and significant effect for hypertension indicates that individuals with this diagnosis use tobacco products less often, when the effects of age, gender, and education are controlled.

With regard to physical activities in leisure time at the recommended level, the practice is significantly more frequent among young and male individuals, with higher education level. It is noteworthy that there was no significant effect of hypertension, i.e., the practice of regular physical activity is not significantly higher among individuals with hypertension (Table 3).

According to the results presented, also, in Table 3, the recommended consumption of fruit and vegetable was associated to age (the older, the higher the intake frequency), to the female gender, and to education level, with less frequent intake for lower education levels. The effects of having a hypertension diagnosis were not statistically significant.

The excessive use of alcohol showed statistically significant associations with age and gender (excessive use more often observed among young males), and with lower education level (incomplete elementary school). There was no significant effect on the diagnosis of hypertension.

When analyzing the perception of low salt intake, older people, female, and less educated have more frequent perception of low salt intake. After controlling these variables, the effects of the diagnosis of hypertension were positive and highly significant ($p < 0.001$).

Table 2. Proportion (%) of individuals who have received recommendations related to healthy behaviors according to the place of the last health care for diabetes. National Health Survey, Brazil, 2013.

Recomendation	Place of the last consultation			
	Primary Care	Other Public	Private	Total
Keeping a healthy diet (with fruit and vegetable)	95.8	94.3	93.7	94.9
Keeping appropriate weight	93.0	87.8	92.5	91.8
Ingesting less salt	84.4	79.1	86.1	83.9
Practicing regular physical activity	77.7	75.6	80.7	78.3
Not smoking	77.3	76.8	80.4	78.2
Not drinking in excess	89.5	84.6	87.1	87.8
Size of the sample*	1.571	612	1.072	3.255

*Number of individuals diagnosed with diabetes and who had at least one medical care for diabetes.

Table 3. Effects of having the diagnosis of hypertension on the adopted healthy behaviors, controlling for age, sex, and educational level. National Health Survey, Brazil, 2013.

Independent Variables	$\beta^{\#}$	Exp(β)	p-value
Outcome: Current use of tobacco 1 - Yes (n = 9,002); 0 - No (n = 51,200)			
Age (n = 60,202)	0.002	1.002	NS*
Sex			
Female (n = 31,845)	-0.608	0.544	< 0.001
Male (n = 28,357)	-	1	-
Education degree			
Incomplete elementary school (n = 23,438)	0.946	2.575	< 0.001
Incomplete high school (n = 9,347)	0.692	1.997	< 0.001
Incomplete superior degree (n = 19,749)	0.164	1.178	NS*
Complete superior degree (n = 7,668)	-	1	-
Hypertension			
Yes (n = 12,885)	-0.168	0.846	0.006
No (n = 47,317)	-	1	-
Outcome: Practice of physical activity at the recommended level 1 - Yes (n = 13,520); 0 - No (n = 46,682)			
Age (n = 60,202)	-0.019	0.981	< 0.001
Sex			
Female (n = 31,845)	-0.560	0.571	< 0.001
Male (n = 28,357)	-	1	-
Education degree			
Incomplete elementary school (n = 23,438)	-1.443	0.236	< 0.001
Incomplete high school (n = 9,347)	-0.838	0.433	< 0.001
Incomplete superior degree (n = 19,749)	-0.563	0.570	< 0.001
Complete superior degree (n = 7,668)	-	1	-
Hypertension			
Yes (n = 12,885)	0.015	1.015	NS*
No (n = 47,317)	-	1	-
Outcome: Recommended intake of fruit and vegetable 1 - Yes (n = 22,724); 0 - No (n = 37,478)			
Age (n = 60,202)	0.008	1.008	< 0.001
Sex			
Female (n = 31,845)	0.167	1.182	< 0.001
Male (n = 28,357)	-	1	-

Continue...

Table 3.Continuation.

Independent Variables	$\beta^{\#}$	Exp(β)	p-value
Outcome: Recommended intake of fruit and vegetable 1 - Yes (n = 22,724); 0 - No (n = 37,478)			
Education degree			
Incomplete elementary school (n = 23,438)	-0.596	0.551	< 0.001
Incomplete high school (n = 9,347)	-0.362	0.696	< 0.001
Incomplete superior degree (n = 19,749)	-0.175	0.839	0.001
Complete superior degree (n = 7,668)	-	1	-
Hypertension			
Yes (n = 12,885)	0.056	1.057	NS*
No (n = 47,317)	-	1	-
Outcome: Excessive intake of alcohol 1- Yes (n = 3,679); 0-No (n = 56,523)			
Age (n = 60,202)	-0.025	0.975	< 0.001
Sex			
Female (n = 31,845)	-0.937	0.392	< 0.001
Male (n = 28,357)	-	1	-
Education degree			
Incomplete elementary school (n = 23,438)	0.227	1.255	0.040
Incomplete high school (n = 9,347)	0.137	1.146	NS*
Incomplete superior degree (n = 19,749)	-0.006	0.994	NS*
Complete superior degree (n = 7,668)	-	1	-
Hypertension			
Yes (n = 12,885)	0.061	1.063	NS*
No (n = 47,317)	-	1	-
Outcome: Perception of very low/low salt intake 1- Yes (n = 15,242); 0-No (n = 44,960)			
Age (n = 60,202)	0.021	1.022	< 0.001
Sex			
Female (n = 31,845)	0.370	1.447	< 0.001
Male (n = 28,357)	-	1	-
Education degree			
Incomplete elementary school (n = 23,438)	0.417	1.518	< 0.001
Incomplete high school (n = 9,347)	0.113	1.120	NS*
Incomplete superior degree (n = 19,749)	0.100	1.105	NS*
Complete superior degree (n = 7,668)	-	1	-
Hypertension			
Yes (n = 12,885)	0.565	1.760	< 0.001
No (n = 47,317)	-	1	-

[#]Logistic regression coefficients, *Not statistically significant at the level of 5%.

A similar analysis was performed with the total sample of interviewed individuals in the PNS (60,202 individuals) in order to investigate the effects of having the diagnosis of diabetes about the adoption of healthy behaviors (Table 4). The effects of age, gender, and education for the outcomes “current use of tobacco,” “practice of physical activity for leisure,” “recommended fruit and vegetable intake,” and “excessive consumption of alcohol” were similar and kept the same sense of association previously found. Likewise, the fact of being diagnosed with diabetes influenced significantly just the “current use of tobacco.”

In relation to the consumption of sweets in 5 days a weeks or more, the habit was associated to younger women and with higher education, and the effect of having diabetes was negative and highly significant ($p < 0.001$).

DISCUSSION

In the present study, the information from the PNS were used, in order to investigate the different aspects of health promotion activities related to the prevention of the NCDs. In the foreground, the occurrence of recommendation on health behaviors in health care centers to individuals with hypertension and diabetes was investigated. In the sequence, the influence of having been diagnosed with hypertension or diabetes on the adoption of healthy behaviors was investigated.

Regarding the recommendations related to healthy behaviors in health care centers, the results of the present work showed that the actions for promotion of health have had positive repercussion. Despite the National Policy of Health Promotion (*Política Nacional de Promoção da Saúde* – PNPS) having been introduced at least 10 years ago, the recommendations on the practice of healthy behaviors in health care services were reported, in general, by over 80% of the individuals with hypertension and diabetes, regardless of the sector (public or private) of the health care service, with high and similar levels in primary health care and in private health establishments.

These findings corroborate the positive evaluation of the implementation of the PNPS in the period from 2006 to 2014 and reflect on the progress made in health promotion programs, in monitoring chronic NCDs and risk- and protection-associated factors¹⁷. The same way, they confirm the results of the investigative study of having programs for the promotion of healthy lifestyles in primary health care, which showed that the programs are implemented in most primary care units¹⁸.

However, from the perspective of adopting healthy behaviors, the results are proven positive for few healthy behaviors. The fact of having hypertension diagnosis had significant influence on the outcomes “current use of tobacco products” and “perception of low salt intake,” but there was no significant effect for the practice of regular physical activity, nor of the recommended consumption of fruit and vegetable. In case of diabetes, there was a significant effect only on behavior of “current use of tobacco products” and, especially, “frequent intake of sweets.”

Table 4. Effects of having the diagnosis of diabetes on the adopted healthy behaviors, controlling for age, sex, and educational level. National Health Survey, Brazil, 2013.

Independent Variables	$\beta^{\#}$	Exp(β)	p-value
Outcome: Current use of tobacco 1 - Yes (n = 9,002); 0 - No (n = 51,200)			
Age (n = 60,202)	0.001	1.001	NS*
Sex			
Female (n = 31,845)	-0.612	0.543	< 0.001
Male (n = 28,357)	-	1	-
Education degree			
Incomplete Elementary School (n = 23,438)	0.947	2.579	< 0.001
Incomplete High School (n = 9,347)	0.699	2.011	< 0.001
Incomplete superior degree (n = 19,749)	0.168	1.182	NS*
Complete superior degree (n = 7,668)	-	1	-
Diabetes			
Yes (n = 3,753)	-0.430	0.650	< 0.001
No (n = 56,449)	-	1	-
Outcome: Practice of physical activity at the recommended level 1 - Yes (n = 13,520); 0 - No (n = 46,682)			
Age (n = 60,202)	-0.019	0.981	< 0.001
Sex			
Female (n = 31,845)	-0.560	0.571	< 0.001
Male (n = 28,357)	-	1	-
Education degree			
Incomplete Elementary School (n = 23,438)	-1.444	0.236	< 0.001
Incomplete High School (n = 9,347)	-0.839	0.432	< 0.001
Incomplete superior degree (n = 19,749)	-0.564	0.569	< 0.001
Complete superior degree (n = 7,668)	-	1	-
Diabetes			
Yes (n = 3,753)	0.079	1.082	NS*
No (n = 56,449)	-	1	-
Outcome: Recommended intake of fruit and vegetable 1 - Yes (n = 22,724); 0 - No (n = 37,478)			
Age (n = 60,202)	0.008	1.008	< 0.001
Sex			
Female (n = 31,845)	0.169	1.184	< 0.001
Male (n = 28,357)	-	1	-

Continue...

Table 4. Continuation.

Independent Variables	$\beta^{\#}$	Exp(β)	p-value
Outcome: Recommended intake of fruit and vegetable 1 - Yes (n = 22,724); 0 - No (n = 37,478)			
Education degree			
Incomplete Elementary School (n = 23,438)	-0.595	0.551	< 0.001
Incomplete High School (n = 9,347)	-0.362	0.696	< 0.001
Incomplete superior degree (n = 19,749)	-0.176	0.839	0.001
Complete superior degree (n = 7,668)	-	1	-
Diabetes			
Yes (n = 3,753)	0.077	1.080	NS*
No (n = 56,449)	-	1	-
Outcome: Excessive intake of alcohol 1 - Yes (n = 3,679); 0 - No (n = 56,523)			
Age (n = 60,202)	-0.024	0.977	< 0.001
Sex			
Female (n = 31,845)	-0.932	0.394	< 0.001
Male (n = 28,357)	-	1	-
Education degree			
Incomplete Elementary School (n = 23,438)	0.231	1.260	0.036
Incomplete High School (n = 9,347)	0.144	1.155	NS*
Incomplete superior degree (n = 19,749)	-0.003	0.997	NS*
Complete superior degree (n = 7,668)	-	1	-
Diabetes			
Yes (n = 3,753)	-0.247	0.781	NS*
No (n = 56,449)	-	1	-
Outcome: Intake of sweets in 5 days a weeks or more 1 - Yes (n = 13,051); 0 - No (n = 47,151)			
Age (n = 60,202)	-0.010	0.990	< 0.001
Sex			
Female (n = 31,845)	0.099	1.104	< 0.001
Male (n = 28,357)	-	1	-
Education degree			
Incomplete Elementary School (n = 23,438)	-0.512	0.600	< 0.001
Incomplete High School (n = 9,347)	-0.266	0.766	0.047
Incomplete superior degree (n = 19,749)	-0.211	0.809	NS*
Complete superior degree (n = 7,668)	-	1	-
Diabetes			
Yes (n = 3,753)	0.856	0.425	< 0.001
No (n = 56,449)	-	1	-

[#]Logistic regression coefficients. *Not statistically significant at the level of 5%.

Among the limitations of this work, it is important to observe that physical measures and the results of laboratory tests (blood and urine) carried out in the PNS were not disclosed yet and, therefore, are still not available for analysis. Thus, in the present study, we were not able to assess the effects of hypertension and diabetes diagnosis on excess of weight, as well as on the levels of sodium in the urine. The analysis was restricted, therefore, to the perception of the individuals, such as in the case of salt intake. Besides that, it is believed that the recommendation of not smoking could have been less reported by the individuals who had never smoked, and the recommendation of not drinking in excess less mentioned by those who do not have the habit of drinking alcohol.

As for the results relating to the adoption of healthy behaviors obtained by the multivariate logistic regression, the effects of having hypertension or diabetes were positive and statistically significant in relation to the habit of smoking, even if controlled by age, gender, and education level. The likely explanations for these findings fall, probably, on the historical prevention of use of tobacco products in the country²⁰ and the overall and widespread knowledge of the harmful effects of smoking by the Brazilian population²¹.

On the other hand, despite the high proportion of recommendations for the practice of physical activities in health care centers, the adoption of this practice was not significantly higher among individuals with hypertension or diabetes. Unlike smoking, the promotion of physical activities has a more recent history in Brazil. Despite the several actions to promote physical activities, such as building proper facilities for the practice with proper equipment for exercising¹⁷ and the initiatives for professional capacitation in health and primary health care²², the compliance of the population is still beyond the expected level, as it also occurs in other countries²³.

As for eating habits, previous studies had already shown low levels of compliance to the habit of eating vegetable and fruit^{24,25}. In the present work, it was clear, as well, that the adoption of this habit was not significantly higher among hypertensive and diabetic individuals, despite the high frequency of recommendations related to diet in the health centers.

The results showed that, therefore, Brazilians prioritize not adopting (or terminating) habits that, admittedly, are harmful to one's health rather than taking upon practices that will benefit them. In the case of individuals with diabetes, there was a significant effect on the behavior of not eating sweets often. In the hypertension situation, there was a significant effect for the perception of low salt intake. However, both for hypertensive and diabetic individuals, there was no significantly higher loyalty to regular physical activities or to an adequate intake of fruit and vegetable.

A recent study in Norway showed that the practice of physical activities was significantly associated with longevity among non-smokers. Among non-smokers with high fitness conditions, 48.8% of them lived up to 85 years of age, while among non-smokers with low fitness conditions, only 27.9% of them, highlighting the benefits of regular physical activity practice among the ones who do not have the habit of smoking²⁶.

A research in England showed significant effects of the intake of fruit and especially vegetable in the reduction of overall mortality, even after controlling age, gender, social class, body mass index (BMI), alcohol consumption, and the practice of physical activities²⁷.

The same way, as a result from a recent study on the association between multiple healthy behaviors with the “disability-adjusted life year” (DALY) showed that people who take up all healthy behaviors lived for at least two more years with good health, considering that each one of the practices had additional contributions to a long and healthy life²⁸.

CONCLUSION

The results presented here indicate that the adoption of healthy behaviors by the population is a complex process and it does not depend only on the promotion of health at assistential level²⁹. It is necessary to encourage the practice of healthy lifestyles, promoting not only adverse effects to harmful habits, but also benefits for the healthy behaviors and quality aging.

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Received on: 04/27/2015

Final version presented on: 06/19/2015

Accepted on: 06/23/2015