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Nutritional guidelines in health services: the perception of elderly patients with hypertension and diabetes

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Abstract

Objective: To describe some aspects of nutritional care and food practices in view of nutritional guidelines received. *Methods:* Cross-sectional study with elderly patients of both sexes in the city of Campinas-SP, Brazil, using a questionnaire about demographic and socioeconomic data, nutritional care, assessed quality of nutritional guidelines provided and food intake. Inclusion criteria were: 60 years of age and older, high blood pressure (hypertension) and diabetes mellitus, resident of Campinas and voluntary participation. *Results:* A sample of 150 elderly was studied; 66.7% were females with mean age of 69.9 years (SD ± 7.5). Men had received regular nutritional advice in the last 12 months more often than women (68% and 32%). Although most elderly reported having received nutritional guidelines, daily recommended intake was not followed for whole foods (88%), vegetables (71%), fruit (27%); they did not restrict salt (67%) and animal fat (65%) and 65% did not even follow mealtimes. Instructional material with nutritional guidance was received by 80% of men and 64% of women. However, 50% of women and 62% of men reported being in doubt about the guidelines. *Conclusion:* The low adherence to nutritional recommendations is indicative of the need to improve the training of health professionals so that they can give their patients effective advice on food intake. This finding reinforces the importance of the role played by a multidisciplinary health team in encouraging the elderly to adhere to treatment, thus enabling better control of chronic diseases and preventing secondary complications.

Key words: Recommended Dietary Allowances. Nutrition Education. Health of the Elderly. Food Habits. Hypertension. Diabetes Mellitus.

Introduction

Ramos et al.[1] were the first researchers to stress the increase of the aging population of Brazil. They pointed out changes in the epidemiological profile of the elderly, marked by the increase of chronic diseases, and highlighted the costly and ongoing care that they require. With aging, physical and biological capabilities decline gradually and make the elderly more vulnerable to chronic diseases. According to the National Household Sample Survey (PNAD) in 2003, just over 53% of the population aged 65 years and older had one or more chronic diseases, and 50% reported having had three or more medical appointments in the last 12 months.[2]

In the analyses of PNAD in 2003 and 2008, the percentage of elderly patients with both diabetes *mellitus* (DM) and hypertension increased from 8.4% to 11.3% between 60 and 69 years of age; 10.4% to 13.1% in the range 70-79 years; and in older patients, from 9% to 12.1%. The authors also identified higher prevalence in women and in urban areas.[3]

Malta et al.[4] described the high cost of non-communicable chronic diseases; in 2006, the direct costs of outpatient care and hospitalization, according to the Ministry of Health, was R$ 7.5 billion/year. When Schmidt et al.[5] discussed the burden of non-communicable chronic diseases in Brazil, they highlighted the increase in DM, hypertension and overweight, and they believe the causes of such rise are negative changes to people's diet and decreased physical activity.

The Brazilian traditional diet has changed and now comprises food with high caloric density and sugar content, and a large amount of salt and saturated fats. Coupled with a sedentary lifestyle, this diet contributes to the development of chronic diseases such as hypertension and DM.[6] The guidelines of the *American Dietetic Association* (ADA)[7] and the Brazilian Diabetes Society (SBD)[8] reinforce the importance of monitoring and individualized guidelines in order to achieve the goals of the proposed treatment, and they consider food and physical activity as two of the main strategies for control and treatment of DM. The guidelines of the Brazilian Society of Cardiology (SBC),[6] in 2007, showed the importance of dieting to control dyslipidemias; and in 2010, the Brazilian Society of Hypertension (SBH)[9] reported the benefits of the Mediterranean diet, among other recommendations, for control of hypertension.

In chronic diseases, treatment adherence in developed countries is 50% on average, while in developing countries, this percentage is lower and depends on the availability of health services and how accessible they are to the population.[10] A study conducted in Canada showed low adherence of diabetic patients to nutritional recommendations and stressed that adiet should be individualized for greater effectiveness and for have greater adherence of patients to recommendations.[11]

Thus, this study is very relevant in view of factors such as population aging, increased demand of the elderly for health care - especially elderly patients with chronic diseases - and the need to prevent resulting complications. The objective of the study is to describe aspects of nutritional care and food intake practices among the elderly in the face of received nutritional guidelines.

Methods

This is a cross-sectional study of male and female elderly patients with hypertension and DM, who receive care at a health service in the city of Campinas, state of São Paulo. Elderly patients who were being treated at the University Hospital outpatient clinic were interviewed while waiting to be seen. Inclusion criteria were: 60 years of age or older; resident of Campinas; diabetes and hypertension; and voluntary participation in the study by signing an Informed Consent Form.

Data was collected through a questionnaire designed by the authors, considering the following variables:

a) **Demographic and socioeconomic variables:** sex (male and female), age (60-69, 70-79, 80 and +), marital status (married, other.), skin color (white and other), number of children (0, 1, 2, 3 and more), number of household members (living alone, 1, 2 and more), schooling (0-4 years and 5 and more), personal income in minimum wages (MW) (<= 1MW and> = 2MW), retired (yes or no).

b) **Nutritional care in health service:** questions about nutritional care were "*Have you seen a nutritionist in the last three months?*"; "*Have you seen a nutritionist on a regular basis in the past year? / Have you ever seen a nutritionist?*"

c) **Nutritional guidelines and dietary habits**: There were questions about food: "Have you received written guidelines on dietary practices?" (diet, food list, both or none); "*Have your questions about eating practices been answered?*" (yes or no); "*Have you found it difficult to follow the guidelines received?*" (unwillingness, lack of money, forget to eat at times, unaware and received no instruction).

The guidelines received were classified as "yes/no" when the elderly reported having received or not a given guideline. Questions about the received nutritional and dietary practices in the face of these guidelines were collated with the recommendations proposed by SBC[6], SBH[9], SBD[8,12] and ADA,[7] on the consumption of skim milk, vegetables, fruits, legumes, whole food, water, salt, processed spices and high-fat foods.

The *Guia Alimentar para a População Brasileira*[13] (Dietary Guidelines for the Brazilian Population) was also used as a reference for food consumption and frequency of food intake. There are no validated questionnaires, to date, exclusively for the elderly; thus, a questionnaire for adults was used as a reference.[14] As for the frequency of intake of healthy foods, the study variables and response categories were skimmed or semi-skimmed milk, vegetables, fruits and legumes, whole foods (<3 times a week, 3-6 times a week and daily); water consumption (<2 glasses, 5 to 8 glasses, 9 glasses and +). The foods that must be restricted by the guidelines include salt and industrialized spices (no/yes), and high-fat foods (> 2 times a week, 1-2 times a week and seldom). Another question was about mealtime (eats all the time, spends more than 5 hours without eating, eats every 3 hours) and weight loss or maintenance (no/yes).

The last response category above was considered appropriate food consumption, and the last response category was considered as adherence to nutritional recommendations. Daily consumption of healthy foods was chosen as a pattern over the frequency used by Vigitel[15] (5 times or more), which is prevalent in epidemiological studies. Such choice is based on the need to use the best dietary pattern, as these recommendations are part of the non-drug treatment.

For data analysis, the software Epidata version 3.1 was used to enter the database and perform the analyses. Descriptive statistical analyses were performed (simple and relative frequencies) for sex, nutritional guidelines and adherence to nutritional recommendations. The chi square test was used to assess associations.

The project was submitted to the Ethics Committee of the Faculty of Medical Sciences, State University of Campinas and approved by the technical report number 115/233 (10/04/2012).

Results

66.7% of the 150 elderly were women; the age of the participants ranged from 60 to 92 years, mean 69.9 years (SD ± 7.5). Variables with significant differences between men and women were marital status, income, schooling and retirement, and there was a higher percentage of married men, with income of 2MW or more and five years of schooling and over, who received retirement benefits. In general, there was prevalence of both male and female, white, married elderly, with three or more living children and low level of schooling (Table 1).

Table 1. Socio-demographic profile according to sex of elderly patients with diabetes and hypertension, users of a hospital outpatient clinic (n = 150). Campinas-SP, 2013.

Variables	N	Female n=100 (%)	Male n=50 (%)	p value[a]
Age				ns
60-69	77	54.0	46.0	
70-79	54	33.0	42.0	
80 and +	19	13.0	12.0	
Marital status				0.030
Married	95	55.0	80.0	
Other	55	45.0	20.0	
Skin color				Ns
White	99	67.0	64.0	
Other	51	33.0	36.0	
Living children				Ns
0	9	5.0	8.0	
1-2	56	38.0	36.0	
3 and +	85	57.0	56.0	
Number of household members				ns
0				
1	22	18.0	8.0	
2 and +	67	43.0	48.0	
	61	39.0	44.0	
Years of schooling				0.020
0-4	106	77.0	58.0	
5 and +	44	23.0	42.0	
Personal income				0.000
<=1 MW	85	68.0	34.0	
<=2 MW	65	32.0	66.0	
Retired				0.000
Yes	88	46.0	84.0	
No	62	54.0	16.0	

[a]p value in the chi-square test; MW= minimum wage.

ns= non-significant p>=0.05

Although not statistically significant, men reported more frequent appointments with a nutritionist than women, both in the last three months (40% and 28%) and in the last 12 months (68% and 32%), and ever in their lifetime (90% and 74%), as shown in Table 2.

Table 2. Frequency of responses for provision of health care services according to type of professional surveyed and sex of patient with diabetes and hypertension (n = 150). Campinas-SP, 2013.

Variables	N	Female=100 (%)	Male n=50 (%)	p value[a]
Appointment with nutritionist in the last 3 months				ns
Yes	48	28.0	40.0	
Regular nutritional advice in the last 12 months				0.023
Yes	55	32.0	68.0	
Nutritional advice ever received				ns
Yes	119	74.0	90.0	
Type of written nutritional guidelines				ns
Diet and food list	12	7.0	10.0	
Food list	92	57.0	70.0	
None	46	36.0	20.0	
Questions about dietary habits				ns
Yes	81	50.0	62.0	
Difficulty in following the guidelines received[b]				ns
Unwillingness	74	49.0	50.0	
Lacks enough money	39	29.0	20.0	
Forgets eating at mealtimes	69	49.0	42.0	
Unaware	30	18.0	24.0	
No guidelines were received	35	25.0	20.0	

[a]p value in the chi-square test

ns= non-significant p>=0.05

[b] Respondents could choose more than one option; therefore, the total percentage is more than 100%.

In the present study, 80% and 64% of men and women, respectively, reported that they had received some type of written instructional material about nutritional guidelines. There is high frequency of doubt as to the guidelines (62% of men and 50% women). And yet, 49% of women and 50% of men reported unwillingness to eat what was recommended, and 49% of women and 42% of men do not eat at the recommended times (Table 2).

All the elderly patients reported having received guidelines on the need for consumption of vegetables, fruits and water; however, the guidelines are not followed by a certain share of respondents. Only 28.7% consumed vegetables daily, and the vast majority (91.4%) ate only one serving per meal (data not shown). Fruits were consumed daily by 73.3%, but only one serving. Only 13.3% drank less than five glasses of water per day (Table 3).

As for consumption of skimmed milk, 93.3% had received guidelines and 74.3% of the sample reported daily consumption, but only one glass/day. Although almost 40% have not received guidelines on the need for consumption of legumes, the percentages in all categories are very similar to the percentages of patients that had received guidelines, reaching almost 90% in the categories of higher consumption. Only the intake of whole foods was significantly more widespread in the elderly who had received guidance (12.1% and 2% of daily consumption), as shown in Table 3.

The portion of patients that did not follow the guidelines of daily consumption varied by food: whole foods (87.9%), legumes (78.3%), vegetables (71.3%), fruit (26.7%) and skimmed or semi-skimmed milk (25.7%). All the elderly patients reported having been advised to reduce salt intake, but only 33.3% reported having cut down on it. Guidelines for restricted consumption of processed spices were provided to 41.3% of subjects, but the percentage of people with previous advice that followed the guidelines was similar to that of patients who followed the guidelines, but without previous advice (59% and 58%). Restriction on the consumption of foods rich in animal fat reached 92.7%, but their weekly consumption was high (63.6% of those who did not receive guidelines and 59% of those who had received it). Thus, the percentage of non-adherence to the restrictions was 66.7% for salt, 41% for processed spices and 69% for animal fat.

88.7% of patients reported that they had received guidelines on the importance of mealtimes, but only 34.6% of them follow mealtimes properly; 52.6% refrain from eating for more than five hours and 12.8% eat all the time; therefore, 65.4% do not follow the mealtime recommendation (Table 3).

Guidelines on weight maintenance or weight loss were offered to 82% of patients, but the percentage who gained weight was slightly higher in those who had been advised (26% and 22.2%), as shown in Table 3.

Table 3. Frequency of provision of nutritional guidelines/physical activity and adherence to recommendations based on frequency of consumption or behavior in patients with diabetes and hypertension (n = 150). Campinas-SP, 2013

Type of nutritional Guideline	Received guidelines (%)	Adherence to nutritional recommendations (%)		
		< 3 times/week	3-6 times/week	Daily
Skimmed or semi skimmed milk				
Yes	93.3	5.0	20.7	74.3[a]
No	6.7	10.0	30.0	60.0
Vegetables				
Yes	100	35.3	36.0	28.7[b]
Fruit				
Yes	100	5.4	21.3	73.3[c]
Legumes				
Yes	61.3	13.0	65.3	21.7
No	38.7	13.8	65.5	20.7
Whole foods				
Yes	66.0	60.6	27.3	12.1
No	34.0	90.2	7.8	2.0
Water		**<5 glasses**[d]	**5-8 glasses**[d]	**9 glasses and +**[d]
Yes	100	13.3	18.7	68.0
RESTRICTIONS				
Salt		**Unrestricted**		**Restricted**
Yes	100	66.7		33.3
No	0	0		0
Processed spices		**Unrestricted**		**Restricted**
Yes	41.3	41.0		59.0
No	58.7	42.0		58.0
High-fat foods		**>2 times/week**	**1-2 times/week**	**Seldom**
Yes				
No	92.7	7.2	51.8	41.0
	7.3	0	63.6	36.4

OTHER GUIDELINES				
Folllow mealtimes		**Eats all the time**	**More than 5 hours without food intake**	**Eats every 3 hours**
Yes	88.7	12.8	52.6	34.6
No	11.3	17.7	64.7	17.6
Maintain/Lose weight		**Gained**	**Maintained**	**Lost**
Yes	82.0	26.0	50.4	23.6
No	18.0	22.2	51.9	25.9

[a]Serving equivalent to a cup
[b]Equivalent to one serving
[c]Unit or a slice of fruit
[d]Glasses per day

Discussion

The demographic profile of the elderly in this study is similar to that in population health surveys, with a predominance of women, elderly aged 60-69 years and individuals with low income and low level of schooling.[2,16]

There are considerations to make as to limitations and strengths of the present study. Sample size did not allow the observation of significant differences in adoption of the nutritional recommendations between patients that had or not received guidelines. Although the study population received health care in the outpatient clinic of a single hospital, it is somewhat representative of the city, as subjects reside throughout various districts and areas of coverage of health services. A study based on the perception of the elderly provides insights on instructional practices through the perspective of those who actually experience them, and also allows the assessment of the expectations of elderly patients about the way health professionals address their needs.

This study is consistent with the research by Guimarães & Takayanagui,[17] on nutritional advice in diabetic patients in Ribeirão Preto. The authors found that most of the guidelines were prescribed by physicians (96.5%), but only 17.2% of patients followed the dietary recommendations.

In the present study, adherence to nutritional advice to maintain or lose weight was 74%. Similar results were found by Assunção et al.,[18] in a study with 378 diabetic patients conducted in Pelotas, southern Brazil, on weight loss or weight maintenance; 72% of the elderly had received guidance but only 26.5% followed the recommendation. In the present study, a similar percentage (80%) received this guidance, but adherence was higher (45%). A comparison of this study with that of Assunção et al.,[18] for nutritional guidelines, shows that the percentage of patients who received guidance was similar (80% and 85%), but adherence was higher in the present study (74% and 53%).

In the study by Paiva et al.[19] with 72 patients with hypertension or diabetes held in Francisco Morato (state of São Paulo), there was a lower percentage of elderly patients who reported having received guidance on weight maintenance (59.4%); however, 75.0% of the elderly followed the diet either fully or partially.

A study with a random sample, performed with 785 hypertensive and 823 diabetic patients cared for by 208 teams of the Family Health Strategy, distributed over 35 municipalities in the state of Pernambuco, points out that while more than 70% of patients in each group was overweight, only 16% of hypertensive patients and 14% of diabetics reported following the recommendations for weight loss. Adherence to salt restriction was high (90%); it was higher in small towns and especially in diabetic patients with associated hypertension.[20]

Adherence to the Dietary Guidelines, in the present study, is higher than the one observed in the 1990s in a nationwide survey held in the US with adults with hypertension, diabetes, obesity and hyperlipidemia. That survey showed diet adherence in less than 45% of respondents, a percentage that was higher in subjects with three cardiovascular risk factors (59%).[21] Therefore, adherence to dietary recommendations in that study, in subjects whose clinical condition was similar to the ones in our sample, was lower than that of our subjects.

In the present study, although the vast majority of respondents has reported previous nutritional advice, the elderly consumed less than the amounts recommended, according to the guidelines of ADA,[7] SBD,[8,12] SBC[6] and SBH,[9] with respect to vegetables, fruits, legumes and whole foods, and most of them did not have daily intake. As for unhealthy eating behavior, there was high intake of salt, processed spices and animal fat, and only a small portion of patients kept appropriate intervals between meals.

The importance of a healthy diet for the primary prevention of metabolic syndrome is highlighted by a French cohort study, which indicates that individuals who followed the nutritional recommendations were less likely to develop metabolic syndrome, and there was synergism between diet and physical activity.[22]

Although the elderly had received nutritional guidance, a great deal of the patients did not follow them for different reasons: they may have failed to understand the guidelines received and/or felt unmotivated to follow them, and perhaps did not understand the importance of the measures to control the disease. For Cotta et al.,[23] the lack of knowledge about the multifactorial nature of DM and hypertension complicates the understanding of the treatment and decreases adherence. We agree with the authors on the need to stimulate the empowerment of patients by means of nutrition education groups that can enable autonomy of choices, decisions and behaviors towards treatment.

The Household Budget Survey (POF) 2008-2009,[24] showed insufficient consumption of fruits and vegetables, and excessive consumption of animal fat. The eating habits of the general population is similar to the behavior of elderly patients with hypertension and DM in this study. This finding points to the complexity of disease control and the need to take into account economic, cultural and environmental determinants that may influence food choices. A systematic review study referenced several international studies which found greater difficulty in performing healthy choices in low-income populations.[25]

Considering the results of low adherence to nutritional recommendations and insufficient advice observed in this study and in several others, it is clearly crucial to improve the quality of health care, not only by researching individual factors and factors associated with the quality of health services, but also addressing them globally, while including social and cultural aspects and using action strategies for the population, especially the most vulnerable one.

In the study of Assunção & Ursine[26] involving 164 patients with diabetes in a health care unit in Belo Horizonte (state of Minas Gerais), the authors found high adherence to non-pharmacological guidelines. This behavior is explained by the fact that individuals participate in specific groups for diabetics and feel motivated to follow the treatment. Thus, motivation is clearly one of the strategies to improve understanding of the disease, because treatment adherence and group membership expand the network of social support and enable dynamic learning in the interaction with other participants.

This approach should also consider the new *Guia Alimentar para a População Brasileira*[27] (Dietary Guidelines for the Brazilian Population) and discuss the nutritional value of ultra-processed foods as well as encourage the consumption of healthy foods and prioritize fresh products and the preparation of homemade foods. Santos[28] stresses that nutrition education should focus on promoting quality of life and health, rather than the fear of death.

Given the above, it appears necessary to improve the training of health professionals so that they can advise patients with diabetes and hypertension, going beyond drug treatment only.

Conclusion

The low adherence to nutritional recommendations by patients with hypertension and DM points to the need to improve the training of health professionals that will later motivate patients as regards food intake. It also reinforces the importance of the involvement of a multidisciplinary team of health professionals, in order to allow better control of chronic diseases and the prevention of secondary complications.

References

1. Ramos LR, Veras RP, Kalache A. Envelhecimento populacional: uma realidade brasileira. Rev. Saúde Pública 1987; 21:211-24.
2. Lima-Costa MF, Matos DL, Camarano AA. Health inequality trends among Brazilian adults and old-aged: a study based on the National Household Sample Survey (PNAD 1998, 2003). Cienc. Saúde Coletiva 2006; 11(4):941-50.
3. Freitas LRS, Garcia LP. Evolução da prevalência do diabetes e deste associado à hipertensão arterial no Brasil: análise da Pesquisa Nacional por Amostra de Domicílios, 1998, 2003 e 2008. Epidemiol. Serv. Saúde 2012; 21(1):7-19.
4. Malta DC, Cezário AC, Moura L, Morais Neto OL, Silva Junior JB. A construção da vigilância e prevenção das doenças crônicas não transmissíveis no contexto do Sistema Único de Saúde. Epidemiol. Serv. Saúde 2006; 15(3):47-65.
5. Schmidt MI, Duncan BB, Azevedo e Silva G, Menezes AM, Monteiro CA, Barreto SM, et al. Chronic non-communicable diseases in Brazil: burden and current challenges. Lancet 2011; 377(9781):1949-61.
6. Sociedade Brasileira de Cardiologia. IV diretriz brasileira sobre dislipidemias e prevenção da Aterosclerose Departamento de Aterosclerose da Sociedade Brasileira de Cardiologia. Arquivos Brasileiros de Cardiologia 2007; 88(Supl. I):1-19.
7. American Diabetes Association. Standards of medical care in Diabetes. Diabetes Care 2014; 37 (Suppl1): S14-S580.
8. Sociedade Brasileira de Diabetes. Diretrizes da Sociedade Brasileira de Diabetes. Rio de Janeiro: SBD; 2009.
9. Sociedade Brasileira de Hipertensão. VI diretrizes brasileiras de hipertensão. Capitulo 5. Tratamento não medicamentoso e abordagem multiprofissional. Rev. Bras. Hipertens 2010; 17(1):16-20.
10. World Health Organization. Hypertension. In: World Health Organization. Adherence to long-term therapies. Evidence for action. Geneva: WHO; 2003. p. 107-114).

11. Sievenpiper JL, Dworatzek PD. Food and dietary pattern-based recommendations: an emerging approach to clinical practice guidelines for nutrition therapy in diabetes. Can. J. Diabetes 2013, 37(1):51-57.

12. Sociedade Brasileira de Diabetes. Algoritmo para o tratamento do diabetes tipo 2. Atualização 2011. São Paulo: SBD; 2011. Posicionamento oficial SBD n. 3.

13. Brasil. Ministério da Saúde. Guia alimentar para a população brasileira: promovendo a alimentação saudável. Brasília: Ministério da Saúde; 2008.

14. Fisberg RM, Colucci ACA, Morimoto JM, Marchioni DML. Questionário de frequência alimentar para adultos com base em estudo populacional. Rev. Saúde Pública 2008; 42(3):550-554.

15. Brasil. Ministério da Saúde. Vigitel Brasil 2012: vigilância de fatores de risco e proteção para doenças crônicas por inquérito telefônico. Brasília: Ministério da Saúde; 2013.

16. Lebrão ML, Laurenti R. Saúde, bem-estar e envelhecimento: o estudo SABE no Município de São Paulo. Rev. Bras. Epidemiol. 2005; 8(2):127-141.

17. Guimarães FPM, Takayanagui AMM. Orientações recebidas do serviço de saúde por pacientes para o tratamento do portador de diabetes mellitus tipo 2. Rev. Nutr. 2002; 15(1):37-44.

18. Assunção MCF, Santos IS, Gigante PD. Atenção primária em diabetes no Sul do Brasil: estrutura, processo e resultado. Rev. Saúde Pública 2001; 35(1):88-95.

19. Paiva DCP, Bersusa AAS, Escuder MML. Avaliação da assistência ao paciente com diabetes e/ou hipertensão pelo Programa Saúde da Família do Município de Francisco Morato, São Paulo, Brasil. Cad. Saúde Pública 2006; 22(2):377-385.

20. Fontbonne A, Cesse EAP, Sousa IMC, Souza WV, Chaves VLV, Bezerra AFB, et al. Risk factor control in hypertensive and diabetic subjects attended by the Family Health Strategy in the State of Pernambuco, Brazil: the SERVIDIAH Study. Cad. Saúde Pública 2013; 29(6):1195-1204.

21. Ma J, Urizar Jr GG, Alehagn T, Stafford RS. Diet and physical activity counselling during ambulatory care visits in the United States. Prev. Med. 2004; 39(4):815-822.

22. Kesse-Guyot E, Fezeu L, Galan P, Hercberg S, Czernichow S, Castetbon K. Adherence to French nutritional guidelines is associated with lower risk of metabolic syndrome. J. Nutr 2011; 141(6):1134-39.

23. Cotta RMM, Reis RS, Carvalho ALB, Batista KCS, Castro FAF, Alfenas RCG. Reflexões sobre o conhecimento dos usuários no contexto do Programa de Saúde da Família: a lacuna entre o saber técnico e o popular. Physis: Rev. Saúde Coletiva 2008; 18(4):745-766.

24. Levy RB, Claro RM, Mondini L, Sichieri R, Monteiro CA. Distribuição regional e socioeconômica da disponibilidade domiciliar de alimentos no Brasil em 2008-2009. Rev. Saúde Pública 2012; 46(1):6-15.

25. Belon AP, Nykiforuk C. Possibilities and challenges for physical and social environment research in Brazil: a systematic literature review on health behaviors. Cad. Saúde Pública 2013; 29(10):1955-73.

26. Assunção TS, Ursine PGS. Estudo de fatores associados à adesão ao tratamento não farmacológico em portadores de diabetes mellitus assistidos pelo Programa Saúde da Família, Ventosa, Belo Horizonte. Cienc. Saúde Coletiva 2008; 13(Sup. 2):2189-97.

27. Brasil. Ministério da Saúde. Guia alimentar para a população brasileira 2. ed. Brasília: Ministério da Saúde; 2014.

28. Santos LAS. O fazer educação alimentar e nutricional: algumas contribuições para reflexão. Cienc. Saúde Coletiva 2012; 17(2):453-462.

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