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# Adherence to healthy ways of life through counselling by health care professionals

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## ABSTRACT

**OBJECTIVE:** To estimate the prevalence of factors associated with adherence to healthy ways of life.

**METHODS:** This is a cross-sectional study carried out with users aged over 19 from a primary health care unit in Belo Horizonte, MG, Southeastern Brazil, from 2009 to 2010. The sample was selected to estimate the proportion of people who adhere to healthy ways of life (healthy eating and physical activity) through counseling conducted by health care professionals, and associated socio-demographic, dietary and health factors. Additionally, the perceived benefits from the adherence to healthy ways of life and their possible barriers were verified. Descriptive analysis, univariate (Chi-square Test or Fisher's Exact) and multivariate by Poisson Regression were performed.

**RESULTS:** Of the 417 users selected for the survey, only 40.8% received counseling, of which 50.9% demonstrated adherence. In multivariate Poisson regression, adherence was associated with the perception of food being healthy (PR = 1.67, 95%CI 1.15;2.43) and participation in the public service health campaigns (PR = 1.55, 95%CI 1.18;2.03). The main reported benefits of adherence were greater willingness and weight loss and, the most commonly reported barriers were difficulty of changing habits and lack of time.

**CONCLUSIONS:** Adopting healthier lifestyles requires the proposing of strategies that promote adherence, as well as the participation of professionals in implementing counseling as a health promoting action that generates greater autonomy and quality of life among those involved, supported by policies and programs promoting health.

**DESCRIPTORS:** Patient Compliance. Health Behavior. Life Style. Health Promotion.

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## INTRODUCTION

In Brazil, the current health care situation is characterized by the increase in chronic non-communicable diseases (NCD) as a consequence in the increasing adoption of unhealthy lifestyles, especially in the areas of poor nutrition and being physically inactive, due to the processes of industrialization and globalization.<sup>a</sup>

Even though the benefits of a healthy diet, rich in fruit, vegetables, whole grains and fiber and doing regular exercise on promoting health and controlling chronic NCD are currently recognized,<sup>17</sup> many Brazilians<sup>b</sup> have difficulties in following healthy lifestyles with regards to these areas.<sup>19</sup>

Mean adherence to long term treatment for chronic NCD in developing countries is below 50%, which is considered low, according to the World Health Organization (WHO).<sup>21</sup>

According to a study carried out on patients' adherence to healthy lifestyles and the social and psychological processes which pervade the doctor-patient relationship, only 25% of patients seen follow doctor's advice with regards lifestyle changes, such as dietary restrictions and stopping smoking, among others.<sup>10</sup> Moreover, the study by Duran et al<sup>11</sup> revealed an adequate intake of macronutrients in around 60% of individuals who did physical exercise.

Behavior related to adherence is a complex phenomenon with multiple determinants, there being no gold-standard in estimating it.<sup>21</sup> Despite the different strategies for measuring adherence reported in the literature, in observational studies, patient self-reporting through structured interviews is the most frequently used option due to their ease of use, low cost and reliable predictions.<sup>16</sup>

Many patients have difficulty adopting the guidance received in the counseling conducted by health professionals aimed at promoting health and preventing and controlling NCD, mainly because they require changes in behavior and lifestyle.<sup>21</sup> Factors affecting adherence include demographic, psychological and social factors, those related to the patient-health care professional relationship, as well as those related to treatment and to the health care system. Thus, understanding the obstacles to and opportunities for adherence to healthy ways of living in different socio-cultural contexts constitutes a useful strategy for increasing the benefits from actions promoting health and controlling chronic NCD.<sup>9</sup>

The aim of this study was to estimate the prevalence of adherence to healthy ways of living and associated factors.

## METHODS

Cross-sectional study of service users of a basic health care unit (UBS) in Belo Horizonte, MG, Southeastern Brazil, from 2009 to 2010. Primary health care (PHC) in the municipality is structured into nine regions and 147 UBS. Family health strategy (ESF) teams work within these unit, supported by health care professionals from the family health care support services, such as social assistants, homeopaths, nutritionists and psychologists, among others. Each ESF team is responsible for the health of around a thousand families, corresponding to a mean of 3,450 to 4,500 people.

The UBS in question is located in a regions of the city which is extremely socially vulnerable, with high prevalence of chronic NCD, such as high blood pressure (49.5%), diabetes mellitus (36.0%) and dyslipidemia (15.7%).<sup>c</sup> The strong link between these morbidities and unhealthy ways of life, such as being sedentary and an unhealthy diet, added to the pattern of vulnerability and the presence of health promoting activities in the UBS's catchment area were factors which determined the inclusion of this UBS in the investigation.

The study's sample size was defined as 206 participants, based on the criteria of 95% confidence intervals, statistical power of 80% and 9.4% expected adherence in the group which did not receive counselling.<sup>10,11</sup>

Individuals aged over 19 who were waiting to be seen in the UBS were eligible for the study. The interviews, carried out by previously trained interviewers, were scheduled in the morning and afternoon between October 2009 and January 2010. Pregnant women and seriously ill patients were excluded from the study.

The data were collected by academics from courses in the health care area, members of the Education Program for Working for Health (PET-Saúde) of the *Universidade Federal de Minas Gerais* (UFMG), the Belo Horizonte Municipal Health Department, the Ministry of Health and the Ministry of Education.

A pre-tested structured questionnaire, developed based on the instrument proposed by Lopes et al<sup>15</sup> was used.

<sup>a</sup> Ministério da Saúde, Secretaria de Vigilância em Saúde, Secretaria de Atenção à Saúde. Diretrizes e recomendações para o cuidado integral de doenças crônicas não transmissíveis: promoção da saúde, vigilância, prevenção e assistência. Brasília (DF); 2008. (Série B. Textos Básicos de Saúde); (Série Pactos pela Saúde, 8).

<sup>b</sup> Ministério da Saúde, Secretaria de Vigilância em Saúde, Departamento de Análise de Situação de Saúde. Vigitel Brasil 2009: vigilância de fatores de risco e proteção para doenças crônicas por inquérito telefônico. Brasília (DF); 2010. (Série G. Estatística e Informação em Saúde).

<sup>c</sup> Lima AN. Fatores associados ao excesso de peso entre usuários do serviço de promoção à saúde: Academia da Cidade do distrito sanitário leste de Belo Horizonte - Minas Gerais [dissertação de mestrado]. Belo Horizonte: Escola de Enfermagem da Universidade Federal de Minas Gerais; 2009.

Socio-demographic (age, sex, schooling and income), dietary intake (salt, sugar, oil, lean meat, skinless chicken, fruit and vegetables), reported morbidity (high blood pressure, diabetes mellitus, hypercholesterolemia, hypertriglyceridemia and coronary disease), taking medication and doing exercise. Participation in health care services aimed at promoting healthier ways of life was also investigated, such as the Community Leisure Center, located in the area in UBS and offering regular practice of physical exercise and nutritional counseling, as well as nutritional counseling developed in their own individual UBS.

To evaluate dietary intake, questions were included on the frequency and quantity of foodstuffs consumed in the preceding six months.<sup>15</sup> When the frequency was “rarely” or “never”, the item was deemed not to be consumed. Frequency of consumption was compared based on the Food Guide for the Brazilian Population.<sup>d</sup>

To measure the service users’ level of physical activity, the International Physical Activity Questionnaire (IPAQ),<sup>13</sup> revised version, was used. This instrument allows the time spent in moderate and strenuous physical activities (work, household chores, transport and leisure) to be estimated, based on recalled physical activity for the last seven days. From the score obtained, the service users were classified as sedentary, irregularly active, regularly active or active.

The anthropometric evaluation consisted of measuring weight, height, waist (WC) and hip (HC) circumference, according to WHO recommendations.<sup>e</sup>

Based on height, weight, WC and HC measurements, body mass index (BMI) and waist/hip ratio (WHR), respectively, were calculated. To classify the WC, WHR and BMI of adults, the references proposed by the WHO were used<sup>f</sup> and for BMI in the elderly the classification proposed by the Nutrition Screening Initiative was used.<sup>f</sup>

With regards WC, men with WC  $CC \geq 94$  cm to 101.9 cm and women with WC 80 cm to 87.9 cm were classified as at high risk of metabolic complications associated with obesity and as very high risk those men with WC  $\geq 102$  cm and women with WC  $\geq 88$  cm. For WHR, men whose ratio was  $> 1.00$  and women with values  $> 0.85$  were classified as at risk of developing cardiovascular disease.<sup>g</sup>

To define the variable excess weight the following BMI values were used: adults (IMC  $\geq 25.0$  kg/m<sup>2</sup>) and the elderly (IMC  $\geq 27.0$  kg/m<sup>2</sup>).

The outcome variable – service users’ adherence to healthy ways of life – was defined as following advice given verbally by a health care professional, measured by self-reporting.<sup>16,23</sup> Based on the responses obtained, two categories were created: individuals who adhered and individuals who did not adhere to the advice. In the adherence group were included those service users who reported following all the guidelines received from health care professional at any time, or for a time, or those who followed just some of the guidelines proposed. Those who reported attempting to follow the guidance, but not managing to, and those who did not try to follow and guidelines were included in non-adherence group.

The categorical variables analyzed were: sex (female/male); reported diagnosis of disease and health problems (diabetes mellitus, high blood pressure, coronary disease, hypercholesterolemia and hypertriglyceridemia); on medication (yes/no) and type of medication taken (antihypertensive, insulin, oral hypoglycemic, antidepressant or other); smoker (yes/no); familiar with the Community Leisure Center (yes/no); eating chicken skin and fat on meat (yes/no); consider their diet to be healthy (yes/no); attempted to lose weight in the last six months (yes/no); received advice on healthy ways of living (yes/no); level of adherence to guidance (followed all received, followed all for a time and then abandoned them, followed some, tried to follow them but did not manage to, did not try to follow any guidance given); perception of benefits after adhering to advice (higher motivation, weight loss, improved health, others); obstacles to adhesion (difficulty changing habits, lack of time, financial difficulties, lack of family support and others); participation in community nutrition activities (yes/no); level of physical activity according to the International Physical Activity Questionnaire – IPAQ (active, regularly active, irregularly active or sedentary); body mass index classification (underweight, normal weight, overweight, obese); classification of waist circumference (no risk, high risk or very high risk of metabolic complications associated with obesity); classification of waist/hip ratio (not at risk or at risk of developing diseases associated with obesity).

The quantitative variables analyzed were: age (years); household income; *per capita* income (household income divided by number members); years schooling; daily *per capita* salt, sugar and oil intake (monthly consumption/number of individuals who eat lunch and dinner at home); portions of fruit, vegetables and legumes consumed (frequency and quantity consumed

<sup>d</sup>Ministério da Saúde, Secretaria de Atenção à Saúde, Coordenação-Geral de Política de Alimentação e Nutrição. Guia alimentar para população brasileira. Brasília (DF); 2006.

<sup>e</sup>World Health Organization. Physical status: the use and interpretation of anthropometry: report of a WHO Expert Committee. Geneva; 1995. (Technical Report Series, 854).

<sup>f</sup>Nutrition Screening Initiative. Nutrition interventions manual for professionals caring for older Americans: project of the American Academy of Family Physicians, the American Dietetic Association and the National Council on the Aging. Washington (DC); 1992.

transformed into portions/day); time spent in moderate physical activities per week (minutes); time spent in strenuous physical activities per week (minutes); weight (kg); height (meters); waist circumference (centimeters) and waist/hip ratio.

In the descriptive analysis the distribution of the frequency of the categorical variables and measures of central tendency and dispersion for numeric variables were calculated. Their distribution was evaluated using the Kolmogorov-Smirnov test. All had an asymmetrical distribution, being described by mean and median and minimum and maximum values.

To verify the link between the response variable and the explanatory variables Pearson's Chi-squared test or Fisher's exact test for small sample sizes were used. The values of the prevalence ratios, with their respective 95% confidence intervals were estimated. In this analysis, all of the quantitative variables were categorized.

Variables which had a p value below 0.20 in the univariate analysis were included in the multivariate Poisson regression model with robust variance, and the fit was achieved by individually eliminating the variables. Significant variables with a 5% level of significant were maintained as part of the final model.

The statistical analyses were carried out using the Stata program, version 9.2.

There were 432 service users interviewed, with a loss of 3.5% (15), due to not completing the questionnaire (11), interviews with pregnant women (2) and with individuals aged under 20 (2). Therefore, 417 individuals participated in the study, the majority being female (78.9%). The median *per capita* income was US\$ 158.23 (minimum: US\$ 4.43; maximum: US\$ 800.63).

The research was approved by the Research and Ethics Committee of the *Prefeitura de Belo Horizonte* and of the *Universidade Federal de Minas Gerais* in 2009 (Protocol n° 037041020309).

## RESULTS

With regards prevalence of disease, it was observed that 33.3% of the interviewees reported having been diagnosed with high blood pressure, 17.3% with hypercholesterolemia and 10.1% with diabetes mellitus. In addition, 54.7% reported taking some kind of medication, the most common being anti-hypertensive (27.6%) (Table 1).

Regarding nutrition, 58.9% of the individuals were overweight, 53.6% at risk of metabolic complications associated with obesity, according to WC, and 25.2% at risk of developing disease according to the WHR (Table 1).

For participation in health care service activities aimed at promoting healthier lifestyles, only 8.6% reported taking part in physical activity and nutritional guidance in the Community Leisure Center, and 2.9% reported individual nutrition monitoring in the UBS (Table 2).

Moreover, in spite of 56.8% considering their diet to be healthy, less than half of the service users (48.4%) ate lean meat, only 5.5% had an adequate intake of fruit and vegetables, 5.5% of vegetable oil and 19.7% of salt (Table 2).

**Table 1.** Socio-demographic characteristics and prevalence of diseases and health problems among participants. Belo Horizonte, MG, Southeastern Brazil, 2009-2010. (N = 477)

Variable	n	%
Age - years (median; minimum, maximum)	417	39 (20.0;85.0)
Age group		
Adult	366	87.8
The elderly	51	12.2
Female	329	78.9
Income <i>per capita</i> monthly – US\$ (median; minimum, maximum) <sup>a</sup>	387	US\$ 158.23 (4.43;800.63)
Years of schooling (median; minimum, maximum)	417	8 (0.0;18.0)
Reported morbidities		
High blood pressure	139	33.3
Hypercholesterolemia	72	17.3
Diabetes mellitus	42	10.1
Coronary disease	35	8.4
Hypertriglyceridemia	28	6.7
On medication <sup>b</sup>	228	54.7
Type of medication		
Anti-hypertensive	115	50.4
Anti-depressive	50	21.9
Hypoglycemic oral	21	9.2
Insulin	13	5.7
Others <sup>c</sup>	76	33.3
Overweight (%) <sup>d</sup>	239	58.9
Risk of metabolic complications - Waist Circumference <sup>e</sup>		
High	96	23.5
Very high	123	30.1
Risk of developing disease – Waist/hip ratio <sup>e</sup>	103	25.2

<sup>a</sup> No information for 30 individuals

<sup>b</sup> No information for two individuals

<sup>c</sup> Other medications used were: contraceptives (n = 34), levothyroxine (n = 13), hypolipidemic (n = 13), anticonvulsants (n = 5) and antiulcer (n = 5), among others

<sup>d</sup> No information for 11 individuals

<sup>e</sup> No information for nine individuals

Of the service users interviewed, 170 (40.8%) reported having received advice from their UBS at some point, of which two individuals did not respond about their adherence, totaling 168 individuals. Of these, 50.9% (n = 86) reported total or partial adherence to the guidelines proposed (Table 3).

From adhering to healthy ways of living, 90.7% (n = 78) reported feeling some health benefit. The main benefits related by the service users were better motivation (66.7%), weight loss (47.4%) and improved health (25.6%). Benefits such as reduced anxiety, improved self-esteem and reasoning ability and muscular hypertrophy, among others, were also reported.

Among those who did not adhere to advice received (n = 82%), the most commonly reported obstacle to adherence was difficulty in changing habits (36.2%), followed by lack of time (25.4%) and financial difficulties (8.5%). Other obstacles cited were family problems, forgetfulness, lack of patience and distance from the Community Leisure Center.

Table 4 shows the variables significantly associated with adherence ( $p < 0.05$ ) in the uni-variate analysis. With regards the socio-demographic variables, greater reported adherence to advice received was observed in those aged 60 and over compared with those aged between 20 and 39 (PR = 1.59; 95%CI 1.13;2.24). Service users with hypercholesterolemia also had better rates of adherence (PR = 1.48; 95%CI 1.10;1.99), as did those who reported participating in activities in the Community Leisure Center and individual nutrition monitoring in the UBS, those who considered their diet to be healthy and those who had tried to lose weight in the preceding six months ( $p < 0.05$ ).

**Table 2.** Prevalence of factors related to healthy ways of living among participants. Belo Horizonte, MG, Southeastern Brazil, 2009-2010. (N = 417)

Variable	n	%
Participation in Community Leisure Center	36	8.6
Participation in UBS nutritional assistance	12	2.9
Consider their diet to be healthy	237	56.8
Attempted to lose weight in the last six months	165	39.6
Consume skinless chicken	260	63.3
Consume lean meat	196	48.4
Adequate consumption of fruit and vegetables	23	5.5
Adequate consumption of sugar	156	37.4
Adequate consumption of vegetable oil	23	5.5
Adequate consumption of salt	82	19.7
Active or regularly active (IPAQ)	261	62.9
Non smoker	326	78.2

UBS: Basic Health Care Unit; IPAQ: International Physical Activity Questionnaire

**Table 3.** Level of adherence to advice given by health care professionals. Belo Horizonte, MG, Southeastern Brazil, 2009-2010. (N = 170)

Level of adherence to advice	n	%
Followed all of the guidelines given	30	17.6
Followed all of the guidelines given for a time and then gave up	21	12.4
Followed some of the guidelines given	35	20.6
Tried to follow the guidelines but was not able	44	25.9
Did not try to follow any guidelines	38	22.4
No response	2	1.2

In the multivariate analysis, the following remained independently associated with adherence: participation in activities in the Community Leisure Center (PR = 1.55; 95%CI 1.18;2.03) and considering diet to be healthy (PR = 1.67; 95%CI 1.15;2.43) (Table 5).

## DISCUSSION

Although there are no specific parameters for evaluating adherence,<sup>d</sup> the results of this study show that around half of service users reported some degree of adherence to advice received, a higher percentage than that estimated by the WHO for developing countries<sup>d</sup> and those verified in other studies on the same subject.<sup>10,12,18</sup> Although the degree of adherence reflects positive health results for the individuals, as reported, significant barriers to its increasing were detected, indicating the possibility for expansion through appropriate actions.

The reported health benefits of adopting healthier habits were having better motivation, losing weight and health improvements. Similarly, a study carried out with elderly obese women who adhered to a nutrition intervention program associated with physical activity indicated improved health and motivation in daily activities as well as in the context of some chronic diseases and self-esteem.<sup>8</sup> Thus, the importance of adopting healthy ways of living through counselling as a way of helping individuals seeking to improve their health and quality of life is shown.

Among those who did not follow the guidance, obstacles cited included difficulties in changing habits, lack of time and financial conditions, as had also been found in other studies.<sup>1,20</sup>

The socio-demographic context of low income and education contribute to the perception of the existence of obstacles to adherence, given that these factors are hindering the adoption of healthier habits.<sup>3,19</sup> Population studies on the individual factors associated with the use of medical consultations by adults show similar results to those found in this study, with greater participation of females, individuals from lower income backgrounds,

**Table 4.** Variables associated with adherence to healthy ways of living through counselling by health care professionals. Belo Horizonte, MG, Southeastern Brazil, 2009-2010. (N = 168)

Variable	n	Adhered		PR	95%CI
		n	%		
Sex					
Male	32	11	34.4	1	–
Female	136	75	55.1	1.60	0.96;2.65
Age (years)					
20 to 39	64	31	48.4	1	–
40 to 59	82	38	46.3	0.95	0.67;1.35
60 and over	22	17	77.3	1.59	1.13;2.24
Hypercholesterolemia (n = 155)					
No	108	48	44.4	1	–
Yes	47	31	66.0	1.48	1.10;1.99
On medication					
No	59	24	40.7	1	–
Yes	109	62	56.9	1.39	0.56;3.86
Participation in the Community Leisure Center					
No	142	66	46.5	1	–
Yes	26	20	76.9	1.65	1.25;2.18
Participation in UBS nutrition assistance					
No	159	78	49.1	1	–
Yes	9	8	88.9	1.81	1.36;2.39
Consider their diet to be healthy (n = 161)					
No	66	23	34.8	1	–
Yes	95	58	61.1	1.75	1.21;2.53
Attempted to lose weight in the last six months					
No	95	41	43.2	1	–
Yes	73	45	61.6	1.42	1.06;1.91

UBS: Basic Health Care Unit; PR: prevalence ratio  
Pearsons Chi-squared test

with a mean age of 43 and a mean eight years of schooling.<sup>6</sup> It stands out, then, that these characteristics are not uncommon among service users in primary health care and should be taken into consideration when

**Table 5.** Final Poisson regression model of variables associated with adherence to healthy ways of living through counselling by health care professionals. Belo Horizonte, MG, Southeastern Brazil, 2009-2010.

Variable	PR	95%CI	p
Participation in the Community Leisure Center			
No	1	–	0.001
Yes	1.55	1.18;2.03	
Consider their diet to be healthy			
No	1	–	0.006
yes	1.67	1.15;2.43	

PR: prevalence ratio  
Test goodness of fit: p = 0.99

developing health care activities aiming to improve service users' adherence to the proposed strategies.

On verifying the factors associated with adherence, the following variables were kept in the final multivariate model: considering diet to be healthy and participating in Community Leisure Center activities. Considering diet to be healthy was probably a perception obtained from adopting healthier eating habits. However, this perception could be influenced by various factors, meaning the concept of healthy eating changes according to the social construct. Even with the variations, there was a noticeable trend to consider as healthy a diet which included low-calorie 'light' and 'diet' foods, low in animal fat and protein and in salt and sugar and rich in fruit, vegetables and fiber and micronutrients.<sup>5</sup>

The link between participating in Community Leisure Center activities and adherence to healthy ways of living suggests that individuals who participate in this program may have better motivation, social support and

the support of health care professionals in adopting these habits. Accordingly, it was found in a study in Campinas, SP, Southeastern Brazil, that attending a recreation center, like Community Leisure Center, increased the chance of doing moderate or strenuous physical exercise by 11.4 times among the women interviewed.<sup>7</sup>

However, participating in Community Leisure Center activities was not limited to physical exercise, as the space is also aimed at providing the opportunity to give advice on nutrition and social engagement, which could result in greater autonomy and quality of life for those involved. Thus, participating in the program is linked to adherence to both doing physical activity and to healthier eating habits.<sup>14</sup>

Corroborating these findings, in the Brazilian literature Araújo et al<sup>4</sup> identified actions promoting health which contributed to improving the quality of life in the elderly, as they stimulated participation, interaction and empowerment in individuals. Moreover, various programs promoting health showed health benefits in the elderly, as well as in the general population.<sup>4</sup>

Despite the benefits related to programs like the Community Leisure Center, it was found that the service users had insufficient awareness of this program, suggesting its limited divulgation within the community. Thus, widening the divulgation of the program constitutes an important strategy in reinforcing adherence to advice given to service users on healthy ways of living.

When considering the important of adherence to healthier ways of living faced with the service users' health profiles, it becomes indispensable to create strategies which aim to have more participation on the part of the health care professionals in implementing them and to incentivize these professionals to take practical qualifications in health care counselling. Therefore, it

is necessary to consider both the obstacles to adherence reported by service users and the difficulties experienced by health professionals in their implementation in daily work and life. Very often, such difficulties are related to lack of time, motivation theoretical-practical knowledge of the subject, the difficulty inherent in adopting healthier ways of living and to the patients' perception on adhering to the advice.<sup>2,22</sup>

In spite of the findings, the cross-sectional design of the study made it impossible to establish temporal cause-effect relationships between adherence to healthy ways of living and service users' socio-demographic, nutritional and health characteristics. Moreover, other factors, such as availability of health promoting services, in addition to the Community Leisure Center, access to healthy food in the area, the time for diagnosing diseases and use of medicines, that were not analyzed, could be associated with adherence, constituting possible residual effects.

It also needs to be considered that, as the sample process was carried out in only one UBS, the results found cannot be extrapolated to the general population; however, they can contribute to greater knowledge of the subject.

Another limitation of the study is the lack of specific parameters in the literature for evaluating adherence to healthy ways of living, factors which may compromise the conclusions drawn. However, in order to estimate patterns of adherence in observational studies, patient self-reporting based on structured interviews is currently the most commonly used option.<sup>16</sup>

To conclude, the findings of this study reinforce the need for actions in the area of primary health care which encourage the practice and adherence to advice on healthy ways of living through policies and programs promoting health.

## REFERENCES

1. AlQuaiz AM, Tayel SA. Barriers to a healthy lifestyle among patients attending primary care clinics at a university hospital in Riyadh. *Ann Saudi Med.* 2009;29(1):30-5. DOI:10.4103/0256-4947.51818
2. Ampt AJ, Amoroso C, Harris MF, McKenzie SH, Rose VK, Taggart JR. Attitudes, norms and controls influencing lifestyle risk factor management in general practice. *BMC Fam Pract.* 2009;10:59. DOI:10.1186/1471-2296-10-59
3. Annear MJ, Cushman G, Gidlow B. Leisure time physical activity differences among older adults from diverse socioeconomic neighborhoods. *Health Place.* 2009;15(2):482-90. DOI:10.1016/j.healthplace.2008.09.005
4. Araújo LF, Coelho CG, Mendonça ET, Vaz AVM, Siqueira-Batista R, Cotta RMM. Evidências da contribuição dos programas de assistência ao idoso na promoção do envelhecimento saudável no Brasil. *Rev Panam Salud Publica.* 2011;30(1):80-6. DOI:10.1590/S1020-49892011000700012
5. Azevedo E. Reflexões sobre riscos e o papel da ciência na construção do conceito de alimentação saudável. *Rev Nutr.* 2008;21(6):717-23. DOI:10.1590/S1415-52732008000600010
6. Capilheira MF, Santos IS. Fatores individuais associados à utilização de consultas médicas por adultos. *Rev Saude Publica.* 2006;40(3):436-43. DOI:10.1590/S0034-89102006000300011
7. Carvalho ED, Valadares ALR, Costa-Paiva LH, Pedro AO, Morais SS, Pinto-Neto AM. Atividade física e qualidade de vida em mulheres com 60 anos ou mais: fatores associados. *Rev Bras Ginecol Obstet.* 2010;32(9):433-40. DOI:10.1590/S0100-72032010000900004
8. Cavalcanti CL, Gonçalves MCR, Cavalcanti AL, Costa SFG, Ascitti LSR. Programa de intervenção nutricional associado à atividade física: discurso de idosas obesas. *Cienc Saude Coletiva.* 2011;16(5):2383-90. DOI:10.1590/S1413-81232011000500007
9. Delamater AM. Improving patient adherence. *Clin Diabetes.* 2006;24(2):71-7. DOI:10.2337/diaclin.24.2.71
10. DiMatteo MR. Enhancing patient adherence to medical recommendations. *JAMA.* 1994;271(1):79, 83. DOI:10.1001/jama.1994.03510250093050
11. Duran ACFL, Latorre MRDO, Florindo AA, Jaime, PC. Correlação entre consumo alimentar e nível de atividade física habitual de praticantes de exercícios físicos em academia. *Rev Bras Cienc Mov.* 2004;12(3):15-9.
12. 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. DOI:10.1590/S1415-52732002000100005
13. Hallal PC, Matsudo SM, Matsudo VKR, Araújo TL, Andrade DR, Bertoldi AD. Physical activity in adults from two Brazilian areas: similarities and differences. *Cad Saude Publica.* 2005;21(2):573-80. DOI:10.1590/S0102-311X2005000200024
14. Hallal PC, Tenório MCM, Tassitano RM, Reis RS, Carvalho YM, Cruz DKA, et al. Avaliação do programa de promoção da atividade física Academia da Cidade de Recife, Pernambuco, Brasil: percepções de usuários e não-usuários. *Cad Saude Publica.* 2010;26(1):70-8. DOI:10.1590/S0102-311X2010000100008
15. Lopes ACS, Santos LC, Ferreira AD. Atendimento nutricional na Atenção Primária à Saúde: proposição de protocolos. *Nutr Pauta.* 2010;18(101):40-4.
16. Nemes MIB, Santa Helena ET, Caraciolo JMM, Basso CR. Assessing patient adherence to chronic diseases treatment: differentiating between epidemiological and clinical approaches. *Cad Saude Publica.* 2009;25(Supl 3):392-400. DOI:10.1590/S0102-311X2009001500005
17. Neumann AICP, Martins IS, Marcopito LF, Araujo EAC. Padrões alimentares associados a fatores de risco para doenças cardiovasculares entre residentes de um município brasileiro. *Rev Panam Salud Publica.* 2007;22(5):329-39. DOI:10.1590/S1020-49892007001000006
18. Santos ZMSA, Frota MA, Cruz DM, Holanda SDO. Adesão do cliente hipertenso ao tratamento: análise com abordagem interdisciplinar. *Texto Context Enferm.* 2005;14(3):332-40. DOI:10.1590/S0104-07072005000300003
19. Schmidt I, Duncan BB, Silva GA, Menezes AM, Monteiro CA, Barreto SM, et al. Doenças crônicas não transmissíveis no Brasil: carga e desafios atuais. *Lancet.* 2011;377(9781):1949-61. DOI:10.1016/S0140-6736(11)60135-9
20. Thomaz PMD, Costa THM, Silva EF, Hallal PC. Fatores associados à atividade física em adultos, Brasília, DF. *Rev Saude Publica.* 2010;44(5):894-900. DOI:10.1590/S0034-89102010005000027
21. World Health Organization. Adherence to long-term therapies: evidence for action. Geneva; 2003.
22. Wynn K, Trudeau JD, Taunton K, Gowans M, Scott I. Nutrition in primary care: current practices, attitudes, and barriers. *Can Fam Physician.* 2010;56(3):e109-16.
23. Zolnieriek KBH, DiMatteo MR. Physician communication and patient adherence to treatment: a meta-analysis. *Med Care.* 2009;47(8):826-34. DOI:10.1097/MLR.0b013e31819a5acc