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Cohort study of life habits of people with arterial hypertension

Estudo de coorte dos hábitos de vida de pessoas com hipertensão arterial

Estudio de cohorte de los hábitos de vida de personas con hipertensión arterial

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ABSTRACT

Objective: To analyze changes in lifestyle habits after four years of follow-up in people with arterial hypertension. **Methods:** A cohort study was carried out with 487 people interviewed through a household survey and classified as having arterial hypertension in 2011 and re-interviewed in 2015 in a medium-sized municipality in Paraná. Life habits variables analyzed were: smoking, alcohol misuse, free time physical activity, regular consumption of fruits and vegetables and/or legumes, consumption of meat with excess fat. The McNemar test was used to analyze changes in life habits between the two periods stratified by sex and level of education. **Results:** After four years of follow-up, there was a reduction in alcohol misuse ($p<0.001$) and an increase in regular consumption of fruits and vegetables and/or legumes ($p<0.001$) among people with four or more years of study of both sexes. Alcohol misuse, non-regular consumption of fruits and vegetables and/or legumes and consumption of meat with excess fat were higher in men compared to women both in 2011 and in 2015, in both strata of education level. **Conclusion:** There were significant changes in relation to the increase in the consumption of fruits and vegetables and/or legumes in addition to the reduction of alcohol misuse among people with more years of study. Thus, a higher level of education positively influenced the adoption of healthier habits.

Descriptors: Middle Aged; Aged; Hypertension; Lifestyle; Longitudinal Studies.

RESUMO

Objetivo: *Analisar as mudanças nos hábitos de vida após quatro anos de seguimento em pessoas com hipertensão arterial.* ***Métodos:*** *Estudo de coorte realizado com 487 pessoas entrevistadas por meio de inquérito domiciliar e classificadas com hipertensão arterial em 2011 e reentrevistadas em 2015 em um município de médio porte paranaense. Analisaram-se as variáveis de hábitos de vida: tabagismo, consumo abusivo de bebidas alcoólicas, prática de atividade física no tempo livre, consumo regular de frutas e de verduras e/ou legumes, consumo de carnes com excesso de gordura. Para a análise das mudanças dos hábitos de vida entre os dois períodos utilizou-se o teste de McNemar estratificado por sexo e escolaridade.* ***Resultados:*** *Após quatro anos de seguimento, houve redução do consumo abusivo de álcool ($p<0,001$) e aumento do consumo regular de frutas e de verduras e/ou legumes ($p<0,001$) entre pessoas com quatro ou mais anos de estudo, de ambos os sexos. O consumo abusivo de álcool, o consumo não regular de frutas e de verduras e/ou legumes e o consumo de carnes com excesso de gordura apresentaram-se maiores nos homens em comparação com as mulheres, tanto em 2011 quanto em 2015, nos dois estratos de escolaridade.* ***Conclusão:*** *Houve mudanças significativas em relação ao aumento do consumo de frutas e verduras e/ou legumes, além da redução do consumo abusivo de álcool entre pessoas com mais tempo de estudo. Assim, um maior nível de escolaridade influenciou positivamente na adoção de hábitos mais saudáveis.*

Descritores: *Pessoa de Meia Idade; Idoso; Hipertensão; Estilo de vida; Estudos Longitudinais*

RESUMEN

Objetivo: *Analizar los cambios en los hábitos de vida después de cuatro años de seguimiento en personas con hipertensión arterial.* ***Métodos:*** *Estudio de cohorte realizado con 487 personas, entrevistadas por medio de encuesta domiciliaria, y clasificadas*

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con hipertensión arterial en 2011 y nuevamente entrevistadas en 2015 en un municipio de medio porte paranaense. Fueron analizadas las variables de hábitos de vida: tabaquismo, consumo abusivo de bebidas alcohólicas, práctica de actividad física en el tiempo libre, consumo regular de frutas y verduras y/o legumbres, consumo de carnes con exceso de grasa. Para el análisis de los cambios en los hábitos de vida entre los dos periodos fue utilizado el test de McNemar estratificado por sexo y escolaridad. ***Resultados:*** *Después de cuatro años de seguimiento, hubo reducción del consumo abusivo de alcohol (p<0,001) y aumento del consumo regular de frutas y verduras y/o legumbres (p<0,001) entre personas con cuatro o más años de estudio, de ambos los sexos. El consumo abusivo de alcohol, el consumo irregular de frutas y verduras y/o legumbres y el consumo de carnes con exceso de grasa fueron mayores en los hombres en comparación con las mujeres, tanto en 2011 cuanto en 2015, en los dos estratos de escolaridad.* ***Conclusión:*** *Hubo cambios significativos en relación al aumento del consumo de frutas y verduras y/o legumbres, además de la reducción del consumo abusivo de alcohol entre personas con más tiempo de estudio. Así, un mayor nivel de escolaridad influyó positivamente en la adopción de hábitos más saludables.*

Descriptores: *Persona de Mediana Edad; Anciano; Hipertensión; Estilo de Vida; Estudios Longitudinales.*

INTRODUCTION

Cardiovascular diseases are important causes of death worldwide, accounting for approximately one third of the total figure. Hypertension is responsible for at least 45% of deaths from ischemic heart disease and 51% of deaths from cerebrovascular diseases[1,2].

In Brazil, 21.4% of adults self-reported arterial hypertension and, when taking into account the measurement of blood pressure and use of antihypertensive medication, 32.3% have blood pressure greater than or equal to 140/90 mmHg. The prevalence of arterial hypertension increases with age, reaching 71.7% of people over 70 years of age[3]. Its high prevalence and mortality rates make it one of the most important public health problems; therefore, detection, treatment and control are essential to reduce cardiovascular risk. Since arterial hypertension has a multifactorial origin related to non-modifiable risk factors, such as age and sex, and modifiable ones, such as smoking, drinking, physical inactivity, inadequate food consumption and obesity, it is essential that there is a plan of actions towards a healthier lifestyle[4] in addition to drug treatment.

The prevention, control or reversal of modifiable risk factors can occur through the adoption of healthy lifestyle habits, making it essential to propose differentiated and integrated prevention strategies with all social segments implemented in a way that supports initiatives to tackle risk factors[4,5]. Public health actions have focused on health promotion in the sense of encouraging the adoption of healthy practices, aiming at reducing risk factors[6].

The National Health Promotion Program, in conjunction with primary health care, has encouraged several initiatives involving the promotion of physical activity, the prevention and control of smoking and drinking, and the encouragement of healthy eating and maintenance of adequate weight[7].

The relevance of this study focuses on the importance of arterial hypertension and its complications directly affecting people's quality of life and life expectancy. Given that, knowledge of people's behavior in terms of life habits and their changes over the years can contribute to the improvement of actions to prevent and control this disease. Thus, the present study aimed to analyze changes in lifestyle habits after four years of follow-up in people with arterial hypertension.

METHODS

A cohort study comparing two periods – years 2011 and 2015 – was carried out with people aged 40 years or older with arterial hypertension living in the urban area of the municipality of Cambé, in the metropolitan region of Londrina, Northern Paraná, Brazil.

This study is an integral part of a broader research called VIGICARDIO, a project developed by professors and graduate students of the Public Health Graduate Program of the State University of Londrina with the support of the Cambé Health Department to research cardiovascular diseases[8]. The municipality was chosen for this study given its medium size and the opportunity to encompass the urban area in its entirety, the availability of updated population data, the support from the local Health Department and the low frequency of vertical housing, a factor that facilitated the collection of data.

The definition of the sample size was based on the number of inhabitants of the municipality in 2007 (92,888 people), of which 33.1% were 40 years of age or older. Considering a margin of error of 3%, sample proportion of 50%, confidence level of 95%, and an additional 25% for potential losses and rounding, the final sample totaled 1,339 participants[8].

All census sectors were included, as well as a quota of people to be interviewed based on population distribution according to sex and age range. To define the interviewees, we used the geographic map of each sector, block numbering, drawing the block and the initial corner of the route traveled in an anti-clockwise direction. The initial house on the corner was also drawn, defining a sampling interval of 1:2. In households with more than one resident eligible for the interview, a draw was carried out to select a single participant[8].

In 2011, 1,180 individuals were interviewed, 660 of whom were classified as having arterial hypertension based on one of the following criteria: i) use of antihypertensive medication proven by the presentation of primary or secondary packaging, medication information leaflet and/or medical prescription; ii) mean of the last two blood pressure measurements taken at the time of data collection, which should be altered respecting the parameters for systolic blood pressure ≥ 140 mmHg and diastolic blood pressure ≥ 90 mmHg[9].

In the second phase of the project, in 2015, interviews with these people were repeated. The study was carried out with baseline interviews with people classified as having arterial hypertension.

Data were collected through interviews, anthropometric measurements and blood pressure measurements. Blood pressure was measured at least three times during the interview, respecting the time interval and the procedures recommended by the VII Brazilian Guidelines on Hypertension[9].

Characterization variables, such as age, marital status (with a partner and without a partner), years of study (less than four years, four years or more than four years), economic status (A/B and C/D/E) and paid work (yes and no) were used. For the economic status classification, the 2011 and 2014 criteria proposed by the Brazilian Association of Research Companies (*Associação Brasileira de Empresas de Pesquisa – ABEP*) were applied respectively in the first and second phases to classify individuals according to their purchasing power[10,11].

The life habits variables selected followed the definition of the national survey for the Surveillance of Risk and Protection Factors for Chronic Diseases (VIGITEL)[12], except for the practice of physical activity in free time. The variables were: smoking (yes and no), alcohol misuse (yes and no), physical activity in free time (yes and no), regular consumption of fruits and vegetables and/or legumes (yes and no), consumption of meat with excess fat (yes and no).

For smoking, individuals who reported the habit at the time of the interview were considered smokers. Alcohol misuse was determined by the consumption of five or more doses for men and four or more doses for women on a single occasion, at least once in the last 30 days[12]. Physical activity in free time referred to any activity such as walking, stretching, dancing, weight training, gymnastics in a gym, soccer, water aerobics or others, regardless of the weekly frequency and duration. The consumption of fruits, vegetables and/or legumes was established as regular when occurring five or more days a week. The consumption of meat with excess fat was considered when the interviewee reported not removing the visible excess fat and/or the skin of the chicken.

In addition to these habits, changes in two anthropometric indicators were also assessed: body mass index (BMI) (adequate and inadequate) and waist circumference (WC) (adequate and inadequate). For BMI categorization, 25 kg/m^2 was used as a cutoff value considering the lower values adequate[13]. The WC classification considered the cutoff values set by the National Cholesterol Education Program (NCRP) – Adult Treatment Panel III, in which the cutoff value should be 102cm for men and 88cm for women[13], being adequate when the waist circumference measurement indicate values lower than these.

Pearson's chi-square test was used for the analysis of losses according to sociodemographic and economic characteristics among people aged 40 years or older with arterial hypertension. The comparison of life habits between the periods (2011-2015) was stratified by sex and years of study (four years or more and less than four years). The McNemar test was used for the statistical analysis of the comparison of life habits in individuals with AH between the periods (2011-2015) and the Pearson's chi-square test was used for the comparison between the sexes, adopting the significance level of $p<0.05$. Data processing and analysis were performed using the Statistical Package for the Social Sciences (SPSS), version 21.0.

The research was approved by the Human Research Ethics Committee of the State University of Londrina in both periods (Approval No. 236/10 and Approval No. 916.944). All participants signed the an informed consent form.

RESULTS

1,180 people were interviewed in the first phase (2011), 660 of whom were classified as having arterial hypertension. In the second phase (2015), there were 173 losses among the 660 participants classified as having arterial hypertension in 2011 due to changes of address, refusals, deaths and not being found after three attempts. The final population consisted of 487 people with arterial hypertension followed up in both studies (Figure 1).

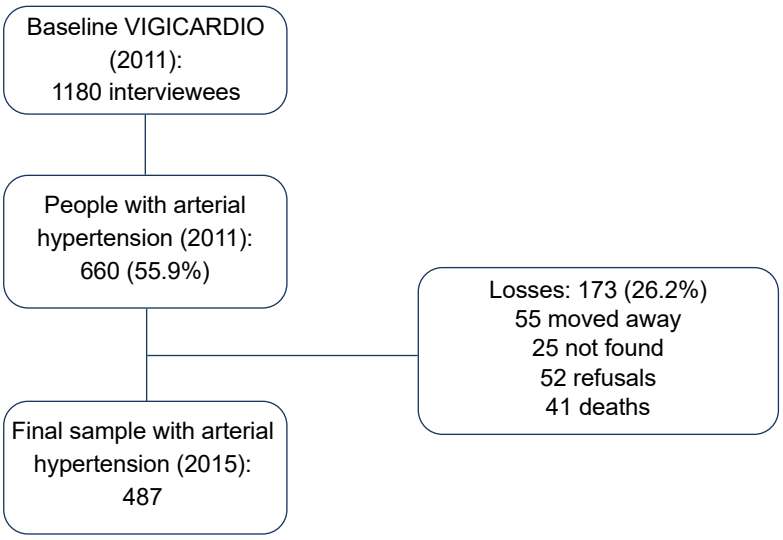

Figure 1 - Study population composition flow chart, 2011 and 2015.

Of the 487 selected participants, 267 (54.8%) were women, and the mean age was 57.3 years in 2011 (standard deviation = 10.0 years). In 2011, 356 (73.1%) of the interviewees had a partner and 333 (68.4%) had four or more years of study, like in 2015. As for participants engaged in paid work, there was a reduction of 273 (56.1%) to 214 (43.9%) after four years.

Table I compares the sociodemographic and economic conditions between the final sample of this study in 2015 and the losses that occurred between 2011 and 2015. With the exception of the variable age, for which the proportion of losses of individuals aged 60 years or older was higher when compared to those aged 40 to 59 years, the proportion of losses was similar between all categories for the other variables.

Table I - Analysis of losses according to sociodemographic and economic characteristics among individuals aged 40 years or older with arterial hypertension in Cambé, Paraná, Brazil, 2011 and 2015.

Variables	Final sample (n=487)	Losses (n=173)	p value
Sex			
Men	267 (76.1)	84 (23.9)	0.092
Women	220 (71.2)	89 (28.8)	
Age			
40 – 59 years	303 (76.5)	93 (23.5)	**0.031**
60 years and older	184 (69.7)	80 (30.3)	
Marital status			
With partner	356 (73.9)	126 (26.1)	0.487
Without partner	131 (73.4)	47 (26.4)	
Years of study			
Less than 4 years	153 (71.5)	61 (28.5)	0.202
4 or more years	334 (74.9)	112 (25.1)	
Economic status			
A/B	164 (74.2)	57 (25.8)	0.468
C/D/E	323 (73.6)	116 (26.4)	
Paid work			
Yes	214 (70.2)	91 (29.8)	0.243
No	273 (76.9)	82 (23.1)	

As for changes in lifestyle habits in the follow-up among respondents with four years or more of study, it was observed that alcohol misuse decreased from 74 (22.2%) to 46 (13.8%) (p< 0.001) and regular consumption of fruits and vegetables increased from 130 (39.0%) to 167 (50.2%) (p<0.001).

Among women with four or more years of study, there was a significant change in alcohol misuse, which represented 16 (9.8%) in 2011 and changed to 7 (4.3%) in 2015 (p=0.002) and in the regular consumption of fruits and vegetables and/or legumes – from 85 (52.1%) to 102 (62.6%) (p=0.019). Among men with four or more years of study, a significant change also occurred in alcohol misuse, which went from 58 (34.1%) to 39 (22.9%) (p=0.005) and in regular consumption of alcohol, fruits and vegetables and/or legumes, which changed from 45 (26.5%) to 65 (38.2%) (p=0.002) (Table II). There was no result on statistically significant changes in lifestyle among individuals with less than four years of study (Table III).

Alcohol misuse, non-regular consumption of fruits and vegetables and/or legumes and consumption of meat with excess fat was higher in men compared to women, both in 2011 and 2015, in both strata of years of study. Smoking was more prevalent in men only in 2011, in both educational levels. Inadequate BMI was higher in men with higher levels of education in 2011 and 2015 and in those with lower levels of education in 2011. Inadequate WC was higher in women of both education levels, both in 2011 and 2015, when compared to men (Tables II and III).

Table II - Lifestyle habits among individuals aged 40 years and older with arterial hypertension and four or more years of study in Cambé, Paraná, Brazil, 2011 and 2015.

Life habits	2011			2015			2011-2015		
	Total n (%)	Women n (%)	Men n (%)	Total n (%)	Women n (%)	Men n (%)	p** total	p** women	p** men
Smoking									
Yes	55 (16.5)	19 (11.7)	36 (21.2)	47 (14.1)	18 (11.0)	29 (17.1)	0.057	1.000	0.039
No	278 (3.5)	144 (88.3)	134 (78.8)	286 (85.9)	145 (89.0)	141 (82.9)			
p*		**0.019**			0.115				
Alcohol misuse									
Yes	74 (22.2)	16 (9.8)	58 (34.1)	46 (13.8)	7 (4.3)	39 (22.9)	**<0.001**	**0.022**	**0.005**
No	259 (77.8)	147 (90.2)	112 (65.9)	287 (86.2)	156 (95.7)	131 (77.1)			
p*		**<0.001**			**<0.001**				
Free time physical activity									
Yes	99 (29.7)	47 (28.8)	52 (30.6)	102 (30.6)	49 (30.1)	53 (31.2)	0.826	0.871	1.000
No	234 (70.3)	116 (71.2)	118 (69.4)	231 (69.4)	114 (69.9)	117 (68.8)			
p*		0.726			0.825				
Regular consumption of fruits and vegetables and/or legumes									
Yes	130 (39.0)	85 (52.1)	45 (26.5)	167 (50.2)	102 (62.6)	65 (38.2)	**<0.001**	**0.019**	**0.002**
No	203 (61.0)	78 (47.9)	125 (73.5)	166 (49.8)	61 (37.4)	105 (61.8)			
p*		**<0.001**			**<0.001**				
Consumption of meat with excess fat									
Yes	153 (45.9)	57 (35.0)	96 (56.5)	156 (46.8)	59 (36.2)	97 (57.1)	0.826	0.871	1.000
No	180 (54.1)	106 (65.0)	74 (43.5)	177 (53.2)	104 (63.8)	73 (42.9)			
p*		**<0.001**			**<0.001**				
Adequate BMI ***									
Yes	79 (23.7)	29 (17.8)	50 (29.4)	75 (22.8)	26 (16.1)	49 (29.2)	0.743	0.804	1.000
No	254 (76.3)	134 (82.2)	120 (70.6)	254 (77.2)	135 (83.9)	119 (70.8)			
p*		**0.013**			**0.005**				
Adequate waist circumference†									
Yes	129 (39.1)	30 (18.5)	99 (58.9)	129 (39.0)	37 (23.0)	92 (54.1)	0.896	0.296	0.108
No	201 (60.9)	132 (81.5)	69 (41.1)	202 (61.0)	124 (77.0)	78 (45.9)			
p*		**<0.001**			**<0.001**				

*Chi-square test: difference between sexes; **McNemar test: differences in prevalence rates between the two periods; *** 4 people in 2015 did not undergo BMI measurement; BMI: body mass index; † 3 people in 2011 and 2 people in 2015 did not undergo waist circumference measurement

Table III - Lifestyle habits among individuals aged 40 years and older with arterial hypertension and less than four years of study in Cambé, Paraná, Brazil, 2011 and 2015.

Life habits	2011			2015			2011-2015		
	Total n (%)	Women n (%)	Men n (%)	Total n (%)	Women n (%)	Men n (%)	p** total	p** women	p** men
Smoking									
Yes	15 (9.7)	6 (5.8)	9 (18.0)	11 (7.1)	5 (4.8)	6 (12.0)	0.219	1.000	0.250
No	139 (90.3)	98 (94.2)	41 (82.0)	143 (92.9)	99 (95.2)	44 (88.0)			
p*		**0.017**			0.105				
Alcohol misuse									
Yes	10 (6.5)	0 (0.0)	10 (20.0)	4 (2.6)	0 (0.0)	4 (8.0)	0.109	-	0.109
No	144 (93.5)	104 (100.0)	40 (80.0)	150 (97.4)	104 (100.0)	46 (92.0)			
p*		**<0.001**			**0.003**				
Free time physical activity									
Yes	44 (28.6)	32 (30.8)	12 (24.0)	32 (20.8)	22 (21.2)	10 (20.0)	0.605	0.076	0.754
No	110 (71.4)	72 (69.2)	38 (76.0)	122 (79.2)	82 (78.8)	40 (80.0)			
p*		0.384			0.869				
Regular consumption of fruits and vegetables and/or legumes									
Yes	59 (38.3)	48 (46.2)	11 (22.0)	72 (46.8)	55 (52.9)	17 (34.0)	0.072	0.281	0.180
No	95 (61.7)	5 (53.8)	39 (78.0)	82 (53.2)	49 (47.1)	33 (66.0)			
p*		**0.004**			**0.028**				
Consumption of meat with excess fat									
Yes	66 (42.9)	37 (35.6)	29 (58.0)	66 (42.9)	35 (33.7)	31 (62.0)	1.000	0.839	0.774
No	88 (57.1)	67 (64.4)	21 (42.0)	88 (57.1)	69 (66.3)	19 (38.0)			
p*		**0.008**			**0.001**				
Adequate BMI ***									
Yes	34 (22.1)	18 (17.3)	16 (32.0)	37 (24.8)	22 (21.8)	15 (31.2)	0.332	0.344	1.000
No	120 (77.9)	88 (82.7)	34 (68.0)	112 (75.2)	79 (78.2)	33 (68.8)			
p*		**0.040**			0.211				
Adequate waist circumference†									
Yes	45 (29.6)	15 (14.6)	30 (61.2)	48 (31.8)	20 (19.6)	28 (57.1)	0.711	0.302	0.791
No	107 (70.4)	88 (85.4)	19 (38.8)	103 (68.2)	82 (80.4)	21 (42.9)			
p*		**<0.001**			**<0.001**				

*Chi-square test: difference between sexes; **McNemar test: differences in prevalence rates between the two periods; *** 5 people in 2015 did not undergo BMI measurement; BMI: body mass index; † 2 people in 2011 and 3 people in 2015 did not undergo waist circumference measurement

DISCUSSION

After four years of follow-up, this study found significant changes in the lifestyle of the population with arterial hypertension among those with four or more years of study, with a reduction in alcohol misuse and an increase in regular consumption of fruits and vegetables and/or legumes. Certain characteristics of the studied municipality may have positively influenced the change in eating habits, such as the implementation and maintenance of a community vegetable crop program in various regions of the city. The program is managed and run by the families residing in the neighborhoods and supported by the municipal government[14].

In addition, considering that the main diseases that affect people became chronic as opposed to acute, there was an expansion of intersectoral actions developed by the Ministry of Health focused on the promotion of healthy and adequate eating as proposed by the Dietary Guidelines for the Brazilian Population[15].

In line with the present study, a cohort study that analyzed behavioral and health changes in older adults also found, after four years, a high percentage of daily consumption of fruits and vegetables above that recommended by WHO[16]. The highest frequency of consumption of these foods found among people with a higher level of education can be explained by the fact that this represents the category with access to better opportunities for employment, income and information[17]. A study carried out in 2019 with data from a monitoring system using a telephone-based survey – VIGITEL in the 26 capitals and the Federal District of Brazil with adults of both sexes also found greater consumption of fruits and vegetables among people with a higher level of education[18].

Low levels of education in health care-related practices can influence the knowledge and understanding of complications resulting from arterial hypertension according to a study carried out by the National Health Survey with the Brazilian adult population in large regions and federated units[19]. In addition, the literature shows barriers to the consumption of fruits, vegetables and/or legumes, which are influenced by socioeconomic factors, with the cost of these foods overwhelming the family budget and thus hindering the adoption of healthy eating habits, a fact that is most common among people with lower levels of education[20].

Another positive change presented by the present study is the reduction of alcohol misuse among people with higher levels of education. This decrease in alcohol intake was also observed in a study with individuals aged 60 years and older, who were also followed up for four years[16].

National policies may have contributed to reducing alcohol misuse through public health strategies such as the National Alcohol Policy. These measures are related to the reduction of alcohol consumption and also to the treatment of users and the monitoring and inspection of advertising of alcoholic beverages in order to reduce their supply in addition to informing and raising awareness about their damage[21]. More recently, the SAFER initiative has proposed the restriction of the supply and advertising of alcoholic beverages with easy access to detection. The treatment was launched by WHO at the United Nations Third High-Level Meeting of the General Assembly on the Prevention and Control of Non-Communicable Diseases with the aim of strengthening actions to reduce harmful alcohol use[22].

A cohort study carried out in Switzerland followed, for a period of 10 years, 4,155 people with high blood pressure and diabetes with the aim of observing the consumption of alcohol and the reduction in alcohol misuse. Thus, it was observed that alcohol misuse was almost twice as high among participants with hypertension compared to those without arterial hypertension[23]. The present study showed that people with the highest levels of education had lower alcohol misuse. This fact was also observed in a study carried out in Spain between 1995 and 2003 in the follow-up of more than 18 thousand people, in which alcohol misuse decreased 6.1% among men with intermediate/high levels of education[24].

Strategies to prevent alcohol misuse are important actions within the scope of public health as they can help minimize the negative impacts on the health of the population[21]. It must be considered that the adoption of healthy lifestyles brings numerous benefits to cardiovascular health, but it is a difficult task for most people. The possibility of changing the way of life involves financial, cultural, life and work issues and the permanence of conservative conceptions that distance the concept of socially possible health[25].

In this context, education is one of the variables that can influence the population's health conditions, with positive changes in life habits being inversely related to the individual's level of education. The literature shows that those with higher levels of education tend to have a better health-related quality of life and live longer free from chronic diseases compared to those with lower levels of education[26]. The benefits obtained with education would result in a lower risky behavior towards health, with good eating habits, better conditions to live actively and independently, despite the diagnosis of a chronic disease, which are barriers to a healthy life[27].

The health-related behaviors presented herein have some limitations with regard to information bias due to the fact that the answers are self-reported, that is, people may have indicated a good health behavior without adopting it in practice. In addition, it is necessary to mention the difficulty in establishing comparisons with other studies due to the selected age range. There is a higher frequency of studies with individuals aged 18 years old and older[18,28] or specifically directed to the older population[27,29,30]. It is also worth mentioning that the methodology used to assess the diet in this study did not consider the consumption of salt, an important indicator for the occurrence of arterial hypertension and cardiovascular diseases.

On the other hand, some strengths of this study should be highlighted: obtaining data through a household survey with personal interviews, conducting blood pressure measurements and anthropometric measurements and *in loco* observation of the antihypertensive drugs used by the interviewees are relevant elements of the study and contribute to add information on the magnitude of health problems in the population.

Still, to maintain healthy habits it is necessary that disease prevention and health care start as early as possible and continue throughout life. And this challenge of adherence to good life habits requires the involvement of people with arterial hypertension and the health team throughout the care process.

CONCLUSION

The findings of this study made it possible to know the changes in the lifestyle of people with arterial hypertension at two different times. Stratification by years of study revealed that people with more years of study showed significant

changes in diet with increased consumption of fruits and vegetables and/or legumes in addition to a reduction in alcohol misuse. Thus, a higher level of education positively influenced the adoption of healthier habits, which can be understood by the fact that this population has more knowledge about risk factors and a better behavior in relation to their health care. The differences in relation to the level of education pointed out show the need to implement individual and collective strategies that are able to cover all segments of society.

CONFLICTS OF INTEREST

The authors declare there are no conflicts of interest.

CONTRIBUTIONS

All the authors had substantial contributions that justify authorship of the article. The conception, planning, study design, analysis and interpretation of data and drafting were carried out by all the authors. All the authors participated in the revision of the research, as well as in the approval of the final version of the article and are responsible for its content and integrity.

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