Self-reported hypertension in adults residing in Campinas, Brazil: prevalence, associated factors and control practices in a population-based study

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Abstract *Objectives: Evaluate the prevalence of self-reported hypertension in adults aged 20 to 59 years as well as identify associated factors, the use of health services and disease control practices according to the possession or not of a private healthcare plan. Methods: A population-based, cross-sectional study was conducted in the city of Campinas, Brazil, involving 957 adults. Results: The prevalence of self-reported hypertension was 14.1%, with greater frequencies found among women, individuals aged ≥ 40 years, those who declared their skin color to be black, those with less schooling, those who did not practice active leisure activities, ex-smokers, overweight or obese individuals and those who rated their own health as not being excellent/very good. No inequalities were detected between individuals with hypertension covered by a private healthcare plan or the Brazilian public healthcare system with regard to access to services, the use of disease-controlling medications and having received counseling on how to manage the disease. However, differences were found regarding the practice of physical activity and diet. Conclusion: Despite the equity disclosed in access to health care , the present findings demonstrate that an insufficient proportion of adults adopt changes in lifestyle to control hypertension, underscoring the central role of public health administrators.*

Key words *Hypertension, Adult health, Epidemiological surveys, Population groups*

Introduction

Chronic non-communicable diseases account for 72% of deaths in Brazil, with 30.4% related to cardiovascular diseases[1]. The prevalence of hypertension in the Brazilian population is 22 to 44% for adults and increases with age, reaching as high as 68% of older adults[2,3]. On a global scale, hypertension is estimated to be responsible for 13% of deaths worldwide[4].

According to the Brazilian National Health Survey conducted in 2013, 21.4% of the population aged 18 years or older reported having a medical diagnosis of hypertension, which corresponds to 31.3 million Brazilians[5]. Data from the National Home Survey conducted in 2008 indicate that the prevalence of hypertension was 38% higher among individuals with a lower level of schooling and 6% higher among those with no private health insurance, after controlling for age, sex and place of residence[6].

The greater life expectancy, nutritional transition and contemporary lifestyle, which translate to unhealthy behaviors, have contributed to the increasing frequency of hypertension in the population[7,8].

Despite the scientific consensus on the magnitude and impact of hypertension, which is considered a serious public health problem, control rates of the disease remain low[9]. Such rates range from 1 to 15% in Latin America and Africa. In contrast, the hypertension control rate among individuals at primary care units in Germany is 64% of the total number of individuals with this disease and 18.5% among elderly individuals. A longitudinal study conducted in Italy reports a rate around 52%. Canada has the best control rate in the world (66%), which is attributed to primary care follow up and a continued educational program for healthcare professionals[10-12].

It is therefore necessary to highlight the role of healthcare services and health professionals as promoters of effective prevention and health recovery practices. In a review study conducted by Toledo et al.[13], the authors found that educational practices directed at individuals with hypertension are insufficient and most (80.4%) adopt normative protocols rather than employing a more liberating approach. According to Rabetti & Freitas[14], such practices result in actions with little impact on the control of hypertension.

Considering the challenges regarding the prevention and control of hypertension, the following were the aims of the present study: estimate the prevalence of self-reported hypertension among adults residing in the city of Campinas, Brazil; identify associations with socio-demographic characteristics, health-related behaviors, ailments, health status and the body mass index; and analyze the use of healthcare services and disease control practices adopted by Brazilian adults with hypertension.

Methods

A population-based, cross-sectional study was conducted involving data from the Campinas Municipal Health Survey (ISACAMP 2008/09). This survey was conducted between February 2008 and April 2009 by the Cooperating Center for the Analysis of the Health Situation of the Collective Health Department of Campinas State University for the analysis of health status among adolescents (10 to 19 years), adults (20 to 59 years) and elderly individuals (60 years or older). The target population was community-dwelling residents of urban areas in the city of Campinas. For the present study, the adult population was analyzed.

Independent samples of 1000 individuals in each age domain were selected, taking into account the estimate of a proportion of 0.50, sampling error between 4 and 5 percentage points, a 95% confidence interval and a 2.0 design effect.

ISACAMP 2008/09 employed two-stage cluster sampling. In the first stage, 50 census sectors were systematically selected, with the probability proportional to the number of residences. Sectors defined by the Brazilian Institute of Geography and Statistics were used and the addresses of the selected sectors were updated considering the time elapsed since the census. The second stage involved the definition of the number of residences to be selected in order to reach the desired sample size based on the ratio of individuals/residences for each age group. Thus, 700 residences were selected for interviews with adults, taking into account possible losses and an 80% response rate. All residents between 20 and 59 years of age at the selected homes were interviewed.

Information was collected using a structured questionnaire with 14 themes. The questionnaire had been tested in a pilot study and was administrated by trained, supervised interviewers.

The dependent variable was self-reported hypertension, which was determined by the answer to the following question: *Has any doctor or other health professional even told you that you have high blood pressure?*

Three sets of independent variables were selected for the analysis of factors associated with hypertension. A fourth set of variables on the use of healthcare services and disease control practices was analyzed in a descriptive fashion according to the possession or non-possession of a private health insurance plan.

▪ *Socio-demographic variables*: sex, age, ethnicity/self-reported skin color, conjugal situation, number of children, schooling (in years of study), monthly household income, possession of a health insurance plan and number of appliances in the home (freezer, vacuum cleaner, washing machine, air conditioner, dishwasher, computer, etc.).

▪ *Health-related behaviors and nutritional status*: smoking; alcohol intake frequency; alcohol dependence evaluated using the Alcohol Use Disorder Identification Test (AUDIT) with a cutoff point of ≥ 8 on a scale of 0 to 40 points[15]; physical activity during leisure, categorized as active (at least 150 minutes per week distributed among at least three days), insufficiently active (less than 150 minutes per week or 150+ minutes per week but distributed among less than three days per week) and inactive (no type of physical activity on any day of the week); nutritional status, evaluated based on the body mass index (BMI) calculated using weight and height and classified as underweight (< 18.5 kg/m^2), ideal range (18.5 to 24.9 kg/m^2), overweight (25.0 to 29.9 kg/m^2) and obesity (≥ 30 kg/m^2)[16].

▪ *Ailments and health status*: Number of chronic diseases and number of health complaints among those included on two checklists and self-rated health status; 1) chronic disease checklist – arterial hypertension, diabetes mellitus, heart disease, cancer, rheumatism/arthritis/arthrosis, osteoporosis, asthma/bronchitis/emphysema, tendinitis/repetitive strain injury/work-related musculoskeletal disorders and circulation problems; 2) health complaint checklist – headache/migraine, back pain/problem, allergy, emotional problem, dizziness/vertigo, insomnia and urinary problem.

▪ *Use of healthcare services and disease-control practices*: time elapsed since the diagnosis, visits to a physician for follow up of hypertension, reasons for not regularly visiting the physician, last visit to a physician for follow up of hypertension, participation in hypertension groups, having received medical counseling related to hypertension and measures taken to control the disease.

Data analysis initially involved estimates of the prevalence of hypertension according to the independent variables. Associations were tested using the chi-squared test with a 5% significance level. Prevalence ratios (crude and adjusted for sex and age) were calculated with 95% confidence intervals. A multiple Poisson regression model was employed in three steps. First, demographic and socioeconomic variables with a p-value < 0.20 in the univariate analysis were incorporated and only those with a p-value < 0.05 after adjustments remained in the model. Second, health-related behaviors and BMI were incorporated using the same cutoff points (p < 0.20 in the univarite analysis and p < 0.05 following adjustments for other variables). In the third, step, ailment and health status variables were incorporated with the same cutoff points as in the previous steps. Proportions were estimated using the chi-square test with a 5% significance level for the analysis of associations between possession/non-possession of a private insurance plan and both the use of health services and disease-control practices.

The data from the interview were entered in a blinded fashion in the Epidata program, version 3.1 (Epidata Assoc., *Odense*, Denmark). Statistical analysis were performed with the aid of the *svy* module of the Stata 11.0 program (Stata Corp., *College Station*, USA), which enables the consideration of weights and sampling design.

The ISACAMP 2008/09 program received approval from the human research ethics committee of the School of Medical Sciences of Campinas State University (Brazil).

Results

Data from 957 adults were analyzed. The female sex accounted for 51.3% of the sample. Mean age was 37.5 years (men: 37.0 years; women: 37.9 years).

The prevalence of self-reported hypertension was 14.1% (95% CI: 12.3 to 16.1%) and was significantly higher among women, those who self-declared their ethnicity/skin color to be black, those with one or more children and those with a lower level of schooling. An increase in the frequency of hypertension occurred with the advance in age, as the prevalence was nearly ten-fold higher among individuals aged 50 to 59 year in comparison to those aged 20 to 29 years. With regard to conjugal status, hypertension was more prevalent among separated and widowed individuals and lower among single individuals (Table 1).

The prevalence of self-reported hypertension was higher among individuals who remained in-

active during leisure activities and ex-smokers and was lower among those who ingested alcoholic beverages one to four times per month. The prevalence increased with the increase in excess weight. The diagnosis of hypertension was reported by 36.8% of obese individuals, representing a 5.08-fold higher prevalence in comparison to those in the ideal BMI range (Table 2).

With regard to comorbidities, self-reported hypertension was more prevalent among individuals with three or more health complaints as well as those who reported one or more chronic diseases. The prevalence of hypertension was significantly higher among individuals who rated their health as good or poor/very poor in comparison to those who rated their health as very good or excellent (Table 3).

Table 4 displays the results of the multiple Poisson regression model. The prevalence of hypertension was higher among women, those aged

Table 1. Prevalence and prevalence ratios (PR) of self-reported hypertension in adults aged 20 to 59 years according to demographic and socioeconomic variables. Campinas Health Survey (ISACAMP, 2008/09).

Variables and categories	n	% (95% CI)	PR (95% CI)
Sex		**p = 0.0138***	
Male	449	11.5 (9.3-14.2)	1
Female	508	16.5 (13.8-19.7)	**1.43 (1.08-1.90)**
Total	957	14.1 (12.3-16.1)	
Age group (in years)		**p = 0.0000***	
20 to 29	305	3.3 (1.6-6.5)	1
30 to 39	232	7.4 (4.4-12.0)	**2.25 (1.01-4.98)**
40 to 49	224	21.1 (16.6-26.5)	**6.45 (3.03-13.75)**
50 to 59	196	31.9 (26.2-38.1)	**9.74 (4.71-20.13)**
Ethnicity/skin color		**p = 0.0421***	
White	697	12.8 (10.8-15.0)	1
Black	85	21.4 (13.9-31.5)	**1.68 (1.08-2.60)**
Brown	168	15.9 (11.8-21.1)	1.25 (0.90-1.73)
Conjugal status		**p = 0.0000***	
Married/stable union	594	15.5 (13.1-18.2)	1
Separated/widowed	105	27.9 (21.8-35.0)	**1.80 (1.30-2.50)**
Single	258	5.5 (3.2-9.4)	**0.36 (0.20-0.63)**
Number of children		**p = 0.0000***	
0	297	4.8 (2.9-8.0)	1
1 to 2	450	14.1 (11.7-16.9)	**2.91 (1.71-4.95)**
3 or more	210	28.1 (22.9-33.9)	**5.80 (3.38-9.93)**
Schooling (in years)		**p = 0.0000***	
0 to 7	273	24.5 (19.4-30.5)	**2.59 (1.68-4.01)**
8 to 11	400	10.7 (8.0-14.1)	1.13 (0.70-1.82)
12 or more	284	9.4 (6.6-13.3)	1
Household income		p = 0.3782*	
< 1 Brazilian monthly minimum wage (BMMW)	382	15.0 (12.1-18.4)	1
≥ 1 to ≤ 3 times BMMW	395	12.4 (9.4-16.2)	0.83 (0.58-1.18)
> 3 times BMMW	180	15.9 (11.9-21.0)	1.06 (0.75-1.51)
Private health insurance plan		p = 0.7659*	
Yes	412	13.8 (11.2-16.8)	1
No	545	14.4 (11.9-17.2)	1.04 (0.79-1.37)
Number of appliances in home		p = 0.2984*	
1 to 5	110	18.7 (13.4-25.4)	1.38 (0.94-2.04)
6 to 10	287	13.7 (10.0-18.3)	1.01 (0.70-1.45)
11 or more	558	13.5 (11.2-16.2)	1

n: number of individuals in sample not weighted. * p-value of chi-squared test.

40 years or older, those who declared their ethnicity/skin color as black, those who remained inactive during leisure activities, ex-smokers, those with overweight or obesity, those who reported two or more chronic disease and those who rated their health as being good or poor/very poor.

Table 5 lists aspects related to hypertension control practices according to the possession or non-possession of a private health insurance plan. A total of 40.2% of the adults with hypertension were diagnosed six or more years earlier, 75.3% reported visiting regularly visiting a physician or healthcare service the purposes of disease control and 71.2% reported receiving counseling on how to manage the disease. Among those who did not visit a physician, the main reason was that they did not consider it necessary (63.4%). The vast majority (96.5%) did not participate in hypertension groups and 16.2% sought a physician or healthcare service more than one year earlier. No significant differences were found between those with a private health insurance plan and those dependent on the Brazilian public healthcare system with regard to regularly visiting a physician, using routine disease-control medications or having received orientations regarding

how to manage hypertension. However, having a private health insurance plan was associated with greater frequencies of physical activity and dieting to lose or maintain weight as well as a greater frequency of disease-control practices.

Discussion

The use of self-reported information on the presence of hypertension can be considered a limitation of the present study, since the prevalence is underestimated in this manner by limiting the investigation only to individuals who had access to a medical diagnosis and omitting those who are unaware of having high blood pressure. Although certain locations offer adequate medical care, individuals less attentive to their health can remain without a diagnosis even when having the disease. Nonetheless, population-based validation studies reveal that self-reported information on hypertension can be considered an appropriate indicator for estimating the prevalence of the disease[17,18].

Moreover, the present findings reveal segments of the adult population with greater prev-

Table 2. Prevalence and prevalence ratios (PR) of self-reported hypertension in adults aged 20 to 59 years according to health-related behaviors and body mass index (BMI). Campinas Health Survey (ISACAMP, 2008/09).

Variables and categories	n	% (95% CI)	PR (95% CI)
Leisure		p = 0.0007*	
Inactive	644	17.2 (14.8-19.8)	**1.98 (1.17-3.33)**
Insufficiently active	134	7.1 (4.0-12.3)	0.82 (0.37-1.80)
Active	179	8.7 (5.1-14.2)	1
Tobacco		p = 0.0032*	
Non-smoker	648	12.7 (10.4-15.5)	1
Ex-smoker	110	26.4 (19.0-35.4)	**2.07 (1.41-3.03)**
Smoker	197	11.9 (7.6-18.2)	0.93 (0.55-1.58)
Frequency of alcohol intake		p = 0.0089*	
Never	501	16.7 (13.5-20.3)	1
1 to 4 times per month	329	8.8 (6.0-12.7)	**0.53 (0.33-0.83)**
2 or more times per week	125	18.4 (12.3-26.6)	1.10 (0.68-1.77)
Alcohol dependency		p = 0.4465*	
Negative	868	13.8 (11.8-16.1)	1
Positive	88	16.7 (10.6-25.2)	1.21 (0.74-1.96)
BMI (kg/m²)		p = 0.0000*	
Underweight	37	7.6 (2.6-19.8)	1.05 (0.36-3.01)
Ideal range	455	7.2 (5.4-9.6)	1
Overweight	301	15.2 (12.1-18.9)	**2.10 (1.43-3.09)**
Obesity	144	36.8 (30.8-43.2)	**5.08 (3.61-7.16)**

n: number of individuals in sample not weighted. * p-value of chi-squared test.

Table 3. Prevalence and prevalence ratios (PR) of self-reported hypertension in adults aged 20 to 59 years according to ailments and health status. Campinas Health Survey (ISACAMP, 2008/09).

Variables and categories	n	% (95% CI)	PR (95% CI)
Number of health complaints		p = 0.0000*	
0	287	8.5 (5.7-12.4)	1
1 to 2	456	13.2 (10.8-16.1)	**1.55 (0.99-2.44)**
3 or more	214	23.9 (18.9-29.7)	**2.81 (1.80-4.38)**
Number of chronic diseases		p = 0.0000*	
0	654	8.8 (7.1-10.9)	1
1	208	18.1 (13.1-24.5)	**2.05 (1.36-3.11)**
2 or more	85	42.1 (31.5-53.5)	**4.78 (3.35-6.83)**
Self-rated health		p = 0.0000*	
Excellent/very good	399	5.9 (4.2-8.2)	1
Good	493	18.5 (15.7-21.8)	**3.15 (2.14-4.64)**
Poor/very poor	65	33.0 (20.6-48.2)	**5.60 (3.17-9.88)**

n: number of individuals in sample not weighted. * p-value of chi-squared test.

alence rates of self-reported hypertension, which enables better guidance with regard to the planning of interventions. The findings add to existing data from previous studies, reaffirming the greater frequency of the disease among socially more vulnerable segments of society beyond the increase stemming from the ageing process.

The prevalence of hypertension was 14.1% in adults aged 20 to 59 years residing in the city of Campinas, which is virtually that same as the 14.0% prevalence reported for the Brazilian population in the 2008 National Household Survey, which revealed that the prevalence increases with age from 3.2% among individuals aged 20 to 29 years to 35% among those aged 50 to 59 years[6]. Data from the Vigitel national telephone survey in 2008 indicate a higher figure of around 23.1% in the adult population ($\geq$ 18 years of age), with changes accompanying the increase in age and with the highest rates among young individuals (18 to 24 years) found in the cities of Teresina and Porto Alegre (10.6%)[19].

Hypertension was more prevalent among women, which is in agreement with data reported in previous studies[5,6,17]. Information from the Vigitel telephone survey demonstrate a greater prevalence rate of the disease among women between 2006 and 2011[20]. This gender difference may be explained by the greater perception of physical signs and symptoms of health conditions among women as well as greater concerns regarding health and seeking medical assistance[6,21,22].

The increase in prevalence with the advance in age is also in agreement with data described in the literature[5,6,20,23]. This increase is related to the longer life expectancy of the population, which leads to a greater burden of chronic diseases, disability and the demand for health services[24].

The prevalence of hypertension was higher among adults with a lower level of schooling, as reported in other studies[5,20]. Analyzing data from the 2008 National Household Survey, Barros et al.[6] found that the chronic diseases analyzed, except tendinitis and cancer, were more prevalent among individuals with less schooling. Lima-Costa[25] found that adults and elderly individuals with less schooling had greater frequencies of smoking and a sedentary lifestyle as well as ingested fruits, vegetables and legumes less. According to the World Health Organization[4] chronic diseases mainly affect socially more vulnerable segments of society due to greater exposure to risk factors, less access to healthcare services and a lower level of health-related information.

With regard to ethnicity, hypertension was more prevalent among individuals who declared themselves to be black, which is in agreement with data reported in previous studies and reaffirms historically and socially determined ethno-racial inequalities[26-29]. According to Malta et al. [26], disparities between blacks and whites are also evidenced in rates of passive smoking in the work environment, the use of alcoholic beverages, the consumption of fatty meats, fruits and

Table 4. Results of Poisson multivariate regression model for variables associated with self-reported hypertension. Campinas Health Survey (ISACAMP, 2008/09).

Variables and categories	First step PR adjusted* (95% CI)	Second step PR adjusted** (95% CI)	Third step PR adjusted*** (95% CI)
Sex			
Male	1	1	1
Female	**1.37 (1.03-1.82)**	1.31 (0.99-1.72)	1.14 (0.85-1.53)
Age group (in years)			
20 to 29	1	1	1
30 to 39	2.08 (0.93-4.63)	1.61 (0.74-3.50)	1.56 (0.72-3.34)
40 to 49	**6.03 (2.76-13.13)**	**4.55 (2.16-9.62)**	**4.05 (1.87-8.76)**
50 to 59	**8.65 (4.04-18.53)**	**5.90 (2.73-12.70)**	**4.65 (2.12-10.18)**
Ethnicity/skin color			
White	1	1	1
Black	**1.87 (1.27-2.74)**	**1.58 (1.15-2.19)**	**1.48 (1.00-2.18)**
Brown	1.29 (0.93-1.79)	1.21 (0.87-1.68)	1.16 (0.84-1.61)
Schooling (in years)			
0 to 7	**1.65 (1.05-2.60)**	1.49 (0.98-2.26)	1.18 (0.80-1.74)
8 to 11	1.23 (0.75-2.00)	1.19 (0.75-1.88)	0.97 (0.63-1.51)
12 or more	1	1	1
Leisure			
Inactive		**1.75 (1.09-2.81)**	1.56 (0.98-2.48)
Insufficiently active		1.05 (0.55-2.00)	0.97 (0.51-1.87)
Active		1	1
Tobacco			
Non-smoker		1	1
Ex-smoker		**1.40 (1.03-1.89)**	1.18 (0.85-1.64)
Smoker		0.91 (0.57-1.45)	0.84 (0.53-1.33)
Body mass index (Kg/m²)			
Underweight		0.89 (0.35-2.28)	0.87 (0.34-2.24)
Ideal range		1	1
Overweight		**1.50 (1.07-2.10)**	1.39 (0.96-2.02)
Obesity		**3.04 (2.19-4.23)**	**2.56 (1.80-3.63)**
Number of chronic diseases			
0			1
1			1.31 (0.90-1.91)
2 or more			**1.71 (1.18-2.47)**
Self-rated health			
Excellent/very good			1
Boa			**1.95 (1.26-3.01)**
Poor/very poor			**1.93 (1.06-3.50)**

* Prevalence ratio adjusted for demographic and socioeconomic variables. **Adjusted for demographic variables, socioeconomic variables, health-related behaviors and body mass index. ***Adjusted for all variables in table.

vegetables and the practice of physical activity in the workplace associated with the exercise of occupational activities that require lower qualifications.

Physical inactivity contributes to more than three million deaths annually and constitutes an important risk factor for non-communicable chronic diseases[4]. The present findings lend support to this statement, as the prevalence of hypertension was higher among individuals who were inactive during leisure activities. Data from the Brazilian Health Ministry reveal that 16.2% (95% CI: 15.6 to 16.9%) of individuals ages 18 years or older do not practice physical activity[30].

Table 5. Use of healthcare services, knowledge on hypertension and disease control practices among adults aged 20 to 59 years according to possession of private health insurance plan. Campinas Health Survey (ISACAMP, 2008/09).

Variables and categories	Total		Private health insurance				p value*
			Yes		No		
	n	%	n	%	n	%	
Time elapsed since diagnosis of hypertension (in years)							0.4863
0 to 5	83	59.8	33	57.0	50	61.9	
6 or more	56	40.2	25	43.0	31	38.1	
Total	139		58		81		
Visit to physician/health service for hypertension follow up							0.2620
No	34	24.7	11	19.2	23	28.7	
Yes	105	75.3	47	80.8	58	71.3	
Reason for not regularly visiting physician/ health service							0.3040
Does not think it necessary	21	63.4	8	73.2	13	58.4	
Lack of time	4	11.2	1	8.6	3	12.5	
Difficulty regarding geographic access	2	5.5	0	0.0	2	8.3	
Others	7	20.0	3	26.8	4	16.6	
Total	34		11		23		
Last visit to physician/health service for hypertension follow up							0.8848
In previous month	27	19.5	10	17.7	17	20.9	
One year ago	89	64.3	38	65.0	51	63.7	
More than one year ago	22	16.2	10	17.3	12	15.3	
Participation in hypertension groups							0.3739
No	134	96.5	57	98.2	77	95.3	
Yes	5	3.5	1	1.7	4	4.7	
Received counseling from physician/health service regarding hypertension							0.6275
No	39	28.8	15	26.6	24	30.5	
Yes	99	71.2	42	73.4	57	69.5	
Hypertension control measures							
Diet without salt	31	22.2	13	23.1	18	21.6	0.8209
Dieting to lose/maintain weight	12	9.0	9	16.1	3	3.6	**0.0063**
Physical activity	14	10.2	10	17.4	4	4.8	**0.0115**
Routine medication	103	73.9	42	72.6	61	74.9	0.7308
Medication when problem arises	14	10.0	7	11.9	7	8.6	0.5110
Nothing	16	11.6	4	6.8	12	15.3	0.1161

n: number of individuals in sample not weighted. * p-value of chi-squared test.

Exercising at least 30 minutes per day most days of the week is recommended for the prevention of hypertension and lowering blood pressure levels[31,32].

Self-reported diagnoses of hypertension were more prevalent among ex-smokers in comparison to individuals who had never smoked. It is estimated that smoking is responsible for 9% of deaths in the world[4]. The greater prevalence of hypertension among ex-smokers in the present investigation is likely the result of reverse causality, as the emergence of hypertension may have led individuals to give up smoking. However, further studies are needed to confirm this hypothesis.

With regard to nutritional status, hypertension was more prevalent among individuals with

overweight or obesity, which is similar to findings described by other researchers[28,33,34]. In Brazil, the prevalence of excess weight increased from 43.2 to 51.0% between 2006 and 2012, which is an annual increase of 1.37%, and the prevalence of obesity increased from 11.6 to 17.4% (annual increase of 0.89%)[35]. In a cross-sectional study involving a sample of 1584 individuals aged 18 to 64 years, Sarno and Monteiro[36] found a risk of hypertension attributable to a body mass index $\geq$ 25 kg/m^2 among 56% of men and 41% of women, confirming the increased risk of hypertension with the occurrence of excess weight.

The prevalence of hypertension was higher among individuals who reported having two or more chronic diseases. The findings of clinical studies demonstrate that 70% of individuals with diabetes also have hypertension and the coexistence of the two conditions significantly increases the risk of developing other comorbidities[37]. Moreover, hypertension was more prevalent among individuals who rated their health as not being very good or excellent. In a population-based study conducted in the city of Pelotas (southern Brazil), 45.4% of adults with hypertension perceived their health as being fair or poor[38].

The main finding of the present study regards hypertension control strategies. Adults with a private health insurance plan performed physical activity more and dieted more to lose or maintain weight, although physical activity was reported by only 17.4% and a controlled diet was reported by only 16.1% of the individuals with hypertension. Souza et al.[39] report similar findings in a study conducted in Novo Hamburgo (southern Brazil), in which these figures were also low, as 22.1% and 7.4% of individuals with hypertension registered with the *Hiperdia Program* recognized physical exercise and the maintenance of adequate weight, respectively, as important practices for controlling the disease. The findings are also in agreement with data reported by Zaitune et al.[23] in a study conducted in Campinas, which revealed greater recognition on the part of elderly individuals regarding the use of dieting and physical activities as strategies for controlling hypertension, despite the low rates of carrying out such practices (9.0 and 22.4%, respectively).

The present results underscore the importance of the qualification of services directed at education activities for health promotion, especially in primary care. Indeed, an experience in Canada reveals that primary care follow up combined with the continued education of healthcare professionals leads to better results regarding the control of hypertension[12].

The findings lend support to the relevance of the investments that have been made in Brazil and the rest of the world to address non-communicable chronic diseases, such as hypertension, beyond medicinal treatment, as there is consensus in the scientific community regarding the positive effects of changing one's lifestyle[40,41]. However, it is necessary to overcome the normative approach that remains dominant in health services, as Toledo et al.[13] point out in reference to educational approaches for individuals with hypertension, since the qualification of healthcare services exerts a positive impact on the efficiency of disease control practices[14].

Conclusion

The possession or non-possession of a private health insurance plan among adults with hypertension was not significantly associated with the use of healthcare services or having received medical orientation regarding the management of the disease, which demonstrates equity in access to health care among such patients in the city of Campinas (southeastern Brazil). However, despite access to regular medical follow up and counseling with regard to managing the hypertension, an insufficient proportion of adults adopt changes in lifestyle to control the disease, such as the practice of physical exercise and adequate eating habits to lose or maintain weight.

This is a worrisome situation that underscores the central role of state and municipal public health administrators, who need to work in an intersectoral manner to strengthen the integrality of care through strategies outlined in the Brazilian National Plans for the Control of Chronic Diseases, in such a way that the actions can lead to the achievement of goals established by the Health Ministry.

Collaborations

LTO Zangirolani and D Assumpção participated in the design, analysis and writing of the article; MAT Medeiros of the final review of the article; MBA Barros of research coordination, analysis and final article review.

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