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# Hypertension as a cardiovascular risk factor in the homeless population of São Paulo

Hipertensão como fator de risco cardiovascular na população em situação de rua de São Paulo

La hipertensión como factor de riesgo cardiovascular en la población sin hogar de São Paulo

## RESUMO

**OBJETIVO:** Descrever a relação entre hipertensão arterial sistêmica e os riscos para desfechos cardiovasculares na população em situação de rua de São Paulo. **MÉTODO:** Estudo de campo de caráter exploratório, transversal e quantitativo, realizado na região central de São Paulo entre 2017 e 2020. 532 voluntários selecionados por conveniência foram submetidos a um questionário previamente estruturado. **RESULTADOS:** 67% autodeclararam usar bebida alcoólica; 66% são tabagistas, 11% ex-tabagistas; 62% não praticam atividade física. A média da pressão arterial foi de 135x87 mmHg. A maioria vive em situação de rua há mais de cinco anos. **CONCLUSÃO:** Evidenciou-se comportamentos nesta população que colocam a integridade da saúde cardiovascular em risco, confirmados pelos níveis pressóricos tendencialmente elevados. Tais achados reforçam a necessidade de novos estudos direcionados para essa população, visando maior visibilidade a esse grupo social e pensando em novas abordagens eficazes, tendo em vista a redução da morbidade e mortalidade cardiovasculares desse público.

**DESCRITORES:** Doenças cardiovasculares; População em situação de rua; Hipertensão arterial sistêmica; Fatores de risco.

## ABSTRACT

**OBJECTIVE:** To describe the relationship between systemic arterial hypertension and the risks for cardiovascular outcomes in the homeless population of São Paulo. **METHOD:** An exploratory, transversal and quantitative field study, carried out in the central region of São Paulo between 2017 and 2020. 532 volunteers selected for convenience were submitted to a previously structured questionnaire. **RESULTS:** 67% self-reported using alcoholic beverages; 66% are smokers, 11% former smokers; 62% do not practice physical activity. Mean blood pressure was 135x87 mmHg. Most have lived on the streets for over five years. **CONCLUSION:** Behaviors in this population that put the integrity of cardiovascular health at risk were evidenced, confirmed by the pressure levels that tend to be high. These findings reinforce the need for further studies aimed at this population, aiming at greater visibility to this social group and thinking of new effective approaches, with a view to reducing cardiovascular morbidity and mortality in this population.

**DESCRIPTORS:** Cardiovascular diseases; Homeless population; Systemic arterial hypertension; Risk factors.

## RESUMEN

**Objetivo:** presentar las principales evidencias encontradas en la literatura sobre autonomía y toma de decisiones en pacientes con enfermedad renal crónica en tratamiento conservador en la selección de terapia renal sustitutiva. **Método:** revisión sistemática de la literatura, mediante búsqueda en las plataformas Biblioteca Virtual en Salud, PubMed y SciELO, en portugués, inglés, francés y español, publicada en los últimos 20 años. La recolección de datos y la selección de estudios se realizó entre marzo y abril de 2020. **Resultados:** Se encontraron 32 estudios. Existe consenso en la literatura sobre la importancia de la participación del paciente en la toma de decisiones. La oferta de educación y orientación para el autocuidado con evaluación de los objetivos y valores del paciente en la vida es fundamental para una elección autónoma. **Conclusión:** la discusión es relevante y escasa en la literatura. Se debe dar prioridad a la toma de decisiones compartida entre el usuario y el equipo asistente, en la institución de tratamiento.

**DESCRIPTORES:** Enfermedades cardiovasculares; Población sin hogar; Hipertensión arterial sistémica; Factores de riesgo.

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**INTRODUCTION**

Chronic non-communicable diseases (NCDs) are a major public health problem and correspond to the largest cause of mortality in the world, especially cardiovascular diseases (CVD).<sup>1</sup> According to the Brazilian Society of Cardiology, systemic arterial hypertension (SAH) is one of the main risk factors (RF) for CVD and affects approximately one third of the adult population. It is defined as a multifactorial clinical condition characterized by high and sustained levels of blood pressure (BP), which is a product of cardiac output multiplied by peripheral vascular resistance. According to current guidelines, systolic blood pressure (SBP) values equal to or above 140 and/or

diastolic blood pressure (DBP) equal to or above 90 mmHg, respectively, are considered to be hypertension.<sup>2,3</sup>

Because it is a condition, asymptomatic, most of the times and that only blood pressure values can determine its diagnosis, SAH becomes a permanent challenge for health systems. It is associated with metabolic alterations, functional and/or structural maladjustments of target organs, and may be aggravated by the presence of other RF, such as smoking, dyslipidemia, overweight and obesity, glucose intolerance and diabetes mellitus (DM).<sup>3</sup> This persistent increase in BP results in a significant decrease in the individual's life expectancy, mainly due to the increased risk of cardiovascular events, such as sudden death, cerebrovascular ac-

cident (CVA), acute myocardial infarction (AMI), heart failure (HF), peripheral arterial disease (PAD) and chronic kidney disease (CKD).<sup>3,4</sup>

When it comes to the homeless population, which is defined as a heterogeneous population group that has poverty, broken or interrupted family ties in common and the street as a form of housing, the risks for the development of CVDs become potentially larger.<sup>5</sup> Mainly because of the situation of social vulnerability in which these individuals find themselves and the large exposure to other health problems. According to the 2019 Census, published by the Department of Social Assistance and Development of the city of São Paulo, it is estimated that there are around 24.344

(twenty-four thousand, three hundred and forty-four) homeless residents in the city, about 53% more compared to the 2015 Census. 6 There is strong evidence that associates social determinants of health, such as education, housing, income and others, with the prevalence of CVD. 7-8 Among them, according to some studies, education stands out, as people with lower levels of education have a higher prevalence of cardiovascular risk factors, a higher incidence of cardiovascular outcomes and a higher cardiovascular mortality rate, regardless of demographic factors. 9

The homeless population lives in a situation of social vulnerability, on the margins of society and susceptible to attacks that put the integrity of their health at risk. Given this sum of aggravating factors that these individuals are exposed to and the growing number of this social group in recent years, there is a need to collect data from this population located in the central regions of São Paulo, with the aim of evaluating the general situation regarding to problems that configure risks, especially cardiovascular ones, and to associate SAH as one of these risk factors for cardiovascular outcomes in this public. In addition, we want to make the data from this study public, in order to expose a real problem expressed in numbers and to illustrate the need for interventions aimed at this population through health promotion and prevention actions.

## METHOD

It consisted of an exploratory, transversal and quantitative field study, carried out in the Central Region of São Paulo, between 2017 and 2020. A previously structured questionnaire was applied and approved by the Institutional Ethics Committee under protocol: 036417, CAAE : 21519413.4.0000.5511.

A total of 532 volunteers selected for convenience participated, the inclusion criteria being being homeless in the central region of São Paulo and respecting the age group between 18 and 60 years. Data were collected through a questionnaire that con-

tained approximately 50 questions related to lifestyle and factors that configure risks for cardiovascular disease. The interviews were carried out after signing the Informed Consent Term, in compliance with Resolution No. 510/16. Each interview lasted an average of 30 minutes and was carried out by undergraduate students from the Nursing course at a private university in São Paulo.

The sociodemographic profiles and the presence of RF for cardiovascular diseases in these individuals were characterized and, subsequently, the measurement of blood pressure (BP) of all respondents was performed using a digital device, and heart rate (HR), following the recommendations of the Current Brazilian Guidelines on Hypertension.

The sociodemographic variables analyzed in this study included: gender (male, female and trans); age/age group (categorized up to 19 years old, 20 to 29 years old, 30 to 49 years old, 50 to 59 years old and over 60); education (illiterate, can read and write, 1st to 4th grade, 5th to 9th grade, incomplete high school, complete high school, incomplete higher education, complete higher education); living on the street (up to one month, one to three months, three to six months, six months to one year, one to two years, two to five years, more than five years). Regarding lifestyle, the following variables were analyzed: alcohol consumption, smoking (smoker, ex-smoker or never smoker) and regular physical activity (practitioner and non-practitioner).

After data collection, the information obtained was statistically analyzed using proportions in graphs and tables that quantitatively represented the results obtained.

## RESULTS

Most respondents were male, about 86%. The female audience was 13% and trans 2%. The most frequent report of skin color was brown skin color (48%), followed by self-report of white (27%), black (23%) and yellow (2%). About 57% of them were of working age, between 30 and 49 years old. As for the level of education, 62% did

not complete high school, where 7% claimed to be illiterate, 7% only know how to read and write, 21% studied between the first and fourth grade and 28% between the fifth and eighth grade of elementary school. Such data can be seen in more detail in Box 1. Regarding the behavioral pattern and exposure to factors that aggravate health during the study period, it was pointed out that 67% of respondents reported using alcohol, 26% did not, 5% rarely, 1% never used it and 1% did not report it. Regarding the pattern of tobacco consumption, the following variables were observed: 66% are smokers, 11% are ex-smokers and 23% have never smoked. Data that can be seen in detail in Graph 1 – Use of alcoholic beverages by the homeless population. São Paulo, SP, Brazil, 2021; and Graph 2.

As for the practice of physical activity, the evidenced data were that 62% of them informed that they do not practice physical activity (sedentary) and 38% declared that they practice (non-sedentary). Data shown in Graph 3.

It was noted that most respondents have lived on the streets for more than five years, corresponding to 36%. 19% for two to five years, 13% for one to two years, 12% for six months to one year, 12% for one to six months and 5% for less than one month.

In addition, an average of systolic blood pressure (SBP), diastolic blood pressure (DBP) and HR of homeless individuals was pointed out, and the following data were evidenced: the mean SBP was 135 mmHg (SD=24,25 ), 87 mmHg DBP (SD=17) and 87 bpm HR (SD=16). Data shown in detail in Graph 4.

## DISCUSSION

This study sought to characterize homeless individuals and associate SAH, socioeconomic, behavioral and environmental issues as risk factors for cardiovascular disease. It was possible to observe that the studied population is composed mostly of males and of working age.

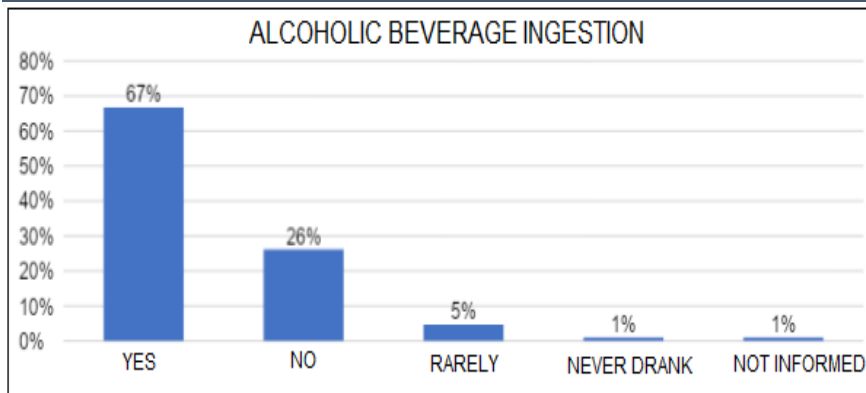
Behavioral or modifiable factors, such as smoking, alcoholism and sedentary lifestyle, cause dysfunctions in the body,

Table 1 - Sociodemographic characteristics of the homeless population. São Paulo - SP, Brazil, 2021.

Characteristics	Total
N	532
<b>Gender</b>	
Female	67
Male	456
Trans	9
<b>Age group</b>	
Up to 19 years old	8
20 to 29	73
30 to 39	162
40 to 49	143
50 to 59	90
Over 60 years old	56
<b>Marital status</b>	
Married/Stable relationship	88
Separated/Divorced	70
Single	356
Widow(er)	18
<b>Ethnicity (Referred)</b>	
Yellow (Referred)	8
White (Referred)	146
Brown (Referred)	253
Black (Referred)	125
<b>Education</b>	
Illiterate	38
Can read and write	36
Elementary School I	111
Elementary School II	147
Complete High School	100
Incomplete High School	58
Complete Higher Education	22
Incomplete Higher Education	20

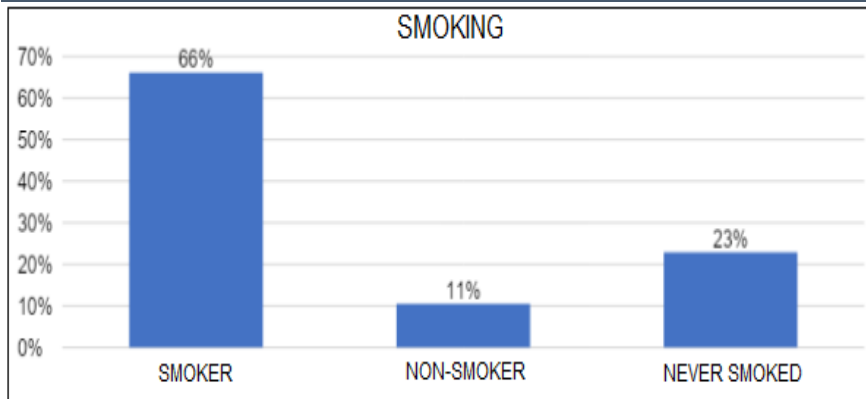
Source: The author, 2021.

Graph 1- Use of alcoholic beverages by the homeless population



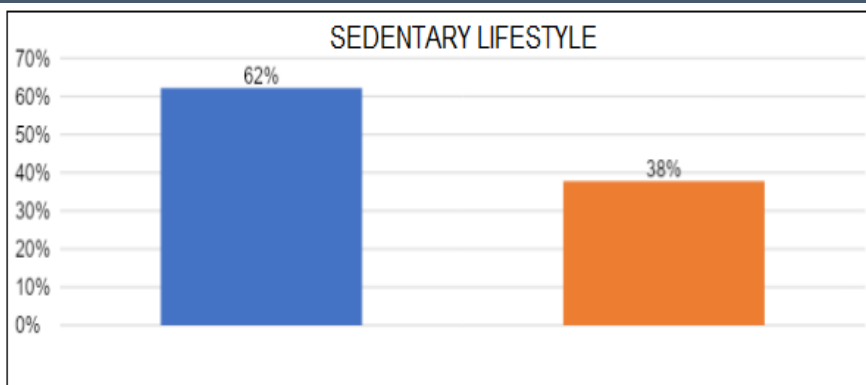
Source: São Paulo, SP, Brazil, 2021.

Graph 2 – Prevalence of smoking in the homeless population.



Source: São Paulo, SP, Brazil, 2021.

Graph 3 – Prevalence of sedentary lifestyles in the population in their situation



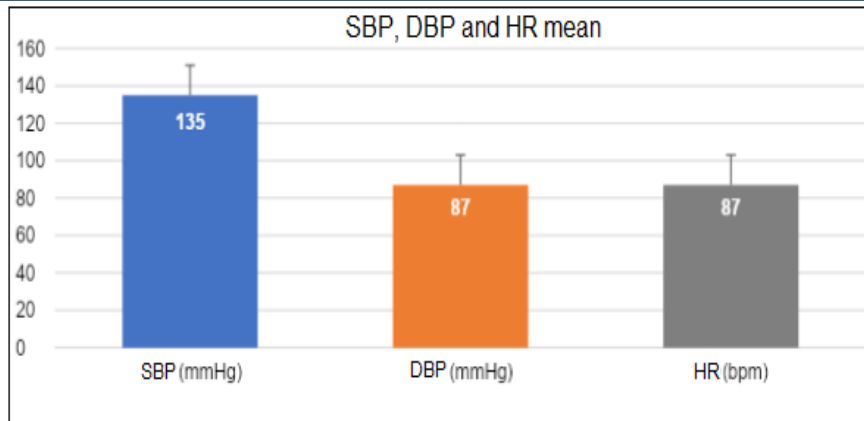
Source: São Paulo, SP, Brazil, 2021.

predisposing the onset of diseases to the cardiovascular system. 10-11 Regarding alcohol consumption, it was found that most

use alcohol (yes or rarely), which characterizes great exposure to the harmful effects of the substance, especially the progressive

increase in blood pressure, as well as greater cardiovascular risks. Studies show that every 30 ml of ethyl alcohol ingested daily

Graph 4 –SBP, PAD and HR mean of the homeless population



Source: São Paulo, SP, Brazil, 2020.

increases BP by around 2 mmHg.<sup>10,12</sup> In addition, most of them are smokers, which is another alarming fact, as prolonged exposure to nicotine and other cigarette compounds increases the risk of atherosclerosis, causes increased blood viscosity, endothelial dysfunction, platelet changes and increased adrenergic activity.<sup>12</sup> Both excessive alcohol consumption and smoking are directly related to the development of diseases such as high blood pressure, acute myocardial infarction and stroke.<sup>12,14</sup>

Regular physical activity is recommended as a non-pharmacological measure in the treatment of SAH, not only for its beneficial effect on BP, but also for the reduction of other cardiovascular risk factors.<sup>15</sup> As shown, there is a predominance of sedentary individuals in the studied popu-

lation, a factor that threatens health, as physical inactivity leads to overweight, obesity, raises triglycerides, reduces HDL-cholesterol and leads to increased waist circumference, metabolic syndrome and insulin resistance, culminating in BP elevation.<sup>16</sup>

Most live on the streets for a long time, which configures greater exposure to the most diverse diseases that interfere with the health of these individuals. Linked to this, there is a predominance of people with low education, which may influence the knowledge and understanding of the severity and possible complications of hypertension. This demonstrates the need to work fundamentally on the continuous development of actions aimed at social determinants of health, especially in the most vulnerable populations.<sup>17</sup>

The evidenced blood pressure values tend to be high according to current guidelines, which inspires immediate care and actions for this public in a vulnerable situation, in order to avoid illness and worse clinical outcomes.

The limitations of the study were the little evidence found in the databases focused on cardiovascular risks in the aforementioned population.

## CONCLUSION

In view of the observed aspects, behaviors in this population that put the integrity of cardiovascular health at risk were evidenced, confirmed by the pressure levels that tend to be high. It can also confirm, according to the data presented and corroborating the studies published in the literature, that the homeless population is more susceptible to risks for cardiovascular outcomes, especially associated with SAH. These findings reinforce the need for further studies aimed at this population, aiming at greater visibility to this social group and thinking of new effective approaches, with a view to reducing cardiovascular morbidity and mortality in this population. In addition, it is necessary a multidisciplinary work, the reinforcement of existing public policies and the creation of new ones aimed at this population group, which contributes to the minimum quality of life of these individuals, aiming at an effective change in this scenario.

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