Revista Brasileira de Enfermagem
REBEn

Cardiovascular risk factors: differences between ethnic groups

Fatores de risco cardiovascular: diferenças entre grupos étnicos

Factores de riesgo cardiovascular: diferencias entre grupos étnicos

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How to cite this article:
Toledo NN, Almeida GS, Matos MMM, Balieiro AAS, Martin LC, Franco RJS, Mainbourg EMT. Cardiovascular risk factors: differences between ethnic groups. Rev Bras Enferm. 2020;73(4):e20180918. doi: http://dx.doi.org/10.1590/0034-7167-2018-0918

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EDITOR IN CHIEF: Dulce Aparecida Barbosa
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Submission: 03-22-2019 **Approval:** 10-12-2019

ABSTRACT

Objectives: to compare the metabolic, anthropometric, tobacco and alcohol consumption indicators considered as risk factors for cardiovascular diseases, as well as the demographic and socioeconomic characteristics between indigenous from Rio Negro, Sateré-Mawé, mixed-race/black and white people living in the city of Manaus. **Methods:** a cross-sectional observational study guided by the STROBE tool. There was a sample of 191 adults of both sexes. Anthropometric measurements, blood pressure and biochemical analyzes were performed. Statistical test was applied to cross color/race/ethnicity variable with the investigated variables. **Results:** indigenous had better metabolic and anthropometric indicators related to cardiovascular diseases than mixed-race/black and white, as well as Sateré-Mawé in relation to Rionegrinos (from Rio Negro). **Conclusions:** the main differences were obesity, dyslipidemia, pre-systemic arterial hypertension/systemic arterial hypertension, and increased circumferences, with a worse situation for mixed-race/black people. The findings indicate differences in risk factors between race/color and ethnicity groups evaluated.

Descriptors: Cardiovascular Diseases; Risk Factors; Indigenous Population; Ethnic Groups; Urban Population.

RESUMO

Objetivos: comparar os indicadores metabólicos, antropométricos, de consumo de tabaco e álcool, considerados como fatores de risco para doenças cardiovasculares, assim como as características demográficas e socioeconômicas entre indígenas do Rio Negro, Sateré-Mawé, Pardos/Negros e Brancos que residem na cidade de Manaus. **Métodos:** estudo observacional transversal, norteado pela ferramenta STROBE. Amostra de 191 adultos de ambos os sexos. Realizadas medidas antropométricas, pressão arterial e análises bioquímicas. Aplicado teste estatístico no cruzamento da variável cor/raça/etnia com as variáveis investigadas. **Resultados:** os indígenas apresentaram melhores indicadores metabólicos e antropométricos relacionados às doenças cardiovasculares que os pardos/negros e brancos, assim como os Sateré-Mawé em relação aos rionegrinos. **Conclusões:** as principais diferenças foram: obesidade, dislipidemia, pré-hipertensão arterial sistêmica/hipertensão arterial sistêmica e circunferências aumentadas, com destaque de pior situação para os pardos/negros. Os achados indicam haver diferenças nos fatores de risco entre os grupos de raça/cor e etnia avaliados.

Descritores: Doenças Cardiovasculares; Fatores de Risco; População Indígena; Grupos Étnicos; Área Urbana.

RESUMEN

Objetivos: comparar los indicadores metabólicos, antropométricos, de consumo de tabaco y alcohol considerados como factores de riesgo para enfermedades cardiovasculares, así como las características demográficas y socioeconómicas entre los indígenas del Rio Negro, Sateré-Mawé, población de raza mixta/negra y blanca que viven en la ciudad de Manaus. **Métodos:** estudio observacional transversal, guiado por la herramienta STROBE. La muestra consistió en 191 adultos de ambos sexos. Se realizaron mediciones antropométricas, presión sanguínea y análisis bioquímicos. La prueba estadística se aplicó a la variable de color/raza/etnia con las variables investigadas. **Resultados:** los ind/genas tenían mejores indicadores metabólicos y antropométricos relacionados con las enfermedades cardiovasculares que los de raza mixta/negros y blancos, así como los Sateré-Mawé en relación con los rionegrinos (del Rio Negro). **Conclusiones:** las principales diferencias fueron: obesidad, dislipidemia, pre-hipertensión arterial sistémica/ hipertensión arterial sistémica y aumento de las circunferencias, con una situación peor para los raza mixta/negros. Los resultados indican diferencias en los factores de riesgo entre los grupos de raza/color y etnia evaluados.

Descriptores: Enfermedades Cardiovasculares; Factores de Riesgo; Población Indígena; Grupos Étnicos; Área Urbana.

CC BY

INTRODUCTION

Worldwide data show that cardiovascular disease (CVD) is considered the leading cause of death from chronic noncommunicable diseases (NCDs)[1]. Risk factors considered modifiable for the onset of CVD are systemic arterial hypertension (SAH), smoking, hypercholesterolemia, diabetes mellitus (DM), obesity, abdominal obesity, sedentary lifestyle, poor fruit and vegetable diet, and psychosocial stress[2].

National data indicate that SAH accounts for 50% of stroke deaths[3]. They also show that for chronic kidney disease (CKD) associated with DM, mortality is estimated at around 30%[2].

With respect to specific populations, studies relate CVD growth to ethnic-racial inequalities because of the high mortality rate, social disruption and socioeconomic marginalization, especially between African descendants and indigenous populations[4-5]. In general, conflicts of cultural identity, changes in lifestyle and destruction of ecosystems have negatively interfered with the daily lives of diverse ethnic groups, particularly indigenous peoples. It is also noteworthy that the conditions of vulnerability in Brazilian indigenous populations are accentuated because they present the worst health indicators[6]. In this perspective, a systematic review study shows a worsening of the metabolic profile as a factor responsible for the vulnerability to the development of CVD, especially regarding the increased prevalence of SAH and DM[7].

Ethnic-racial characterization has been the subject of discussion in several areas of knowledge, especially in epidemiology where the categories color, race and ethnicity are used as variables of exposure to the disease[4]. These categories are also considered essential dimensions for a better understanding about the distribution of health outcomes, enabling the elaboration of public policies more consistent with the needs of the population groups[8]. Finally, studies on the health status of indigenous people living in urban contexts in Brazil are still scarce, particularly regarding the risk factors for the development of cardiovascular diseases, and comparative approach with other ethnic-racial groups living in the same area.

OBJECTIVES

To compare metabolic, anthropometric and tobacco and alcohol consumption which are considered as risk factors for cardiovascular diseases, as well as socioeconomic demographic characteristics between indigenous from *Rio Negro*, Sateré-Mawé, mixed-race/black and white living in the city of Manaus, state of Amazonas, Brazil.

METHODS

Ethical aspects

In accordance with the Brazilian National Health Board (*Conselho Nacional de Saúde*) Resolution 466 of 2012, which regulates the ethical aspects of research involving human subjects, the project was submitted and approved by the Research Ethics Committee of the *Universidade Federal do Amazonas* and the Brazilian Research Ethics Committee.

Design, place of study and period

This is a cross-sectional observational study, guided by the STROBE tool, which was conducted in Manaus from data collected between September 2011 and April 2012, in a sample consisting of adults of both sexes, indigenous people of different ethnic groups, white, mixed-race and black. It is noteworthy that, in relation to white, mixed-race and black people, the target population was the neighbor of the natives, because they share the same social and environmental conditions as the natives.

Population and sample, inclusion and exclusion criteria

Due to the scarcity and difficult access to indigenous groups in urban areas, a convenience sample was built from the invitation of five indigenous associations chosen to represent two thirds of the city's indigenous population. The other part of the sample (non-indigenous) was invited to the health units located in the areas of residence of the indigenous participants of the study. The inclusion criterion was to be over 18 years old. The exclusion criterion was waiting for a medical appointment for cardiovascular disease, including high blood pressure.

The total study sample consisted of 191 individuals, men and women, aged 18 to 65 years old living in a state capital, 78 (41%) indigenous and 113 (59%) non-indigenous (mixed-race, black and white people). Regarding ethnicity, 35 (45%) indigenous people were Sateré-Mawé (from the Andirá and Maráu rivers region, relatively close to Manaus) and 43 (55%) were from various ethnic groups from the far Upper *Rio Negro* region. (more than one-hour flight): Tukano, Baré, Desana, Tariano, Tuyuca, Piratapuia, Arapaço and others. As for the 113 non-indigenous individuals, 42 (37%) were neighbors of the Sateré-Mawé indigenous and 71 (63%) were neighbors of the *Rio Negro* indigenous. The sample was categorized into four groups: Sateré-Mawé indigenous, Upper *Rio Negro* indigenous (hereinafter called *Rionegrinos*), whites and mixed-race people/blacks (grouped because of the low number of black people in the universe of the study population).

Study protocol

For the indigenous population, given their small proportion of the city's population and its large dispersal, the best recruitment strategy was to go through the indigenous associations' members. In addition to being study participants, they assumed an important role in contact with other families of the same ethnic group and/or indigenous area of origin. These indigenous associations were chosen because the ethnic groups they represent constitute an important share (two thirds) of the indigenous population of Manaus[9] and because they are representative, which made it easier for them to locate and communicate with them. The associations included were: Waikirú, Bayaroá, Yápyrehyt, AMISM (freely translated as *Associação das Mulheres Indígenas Sateré-Mawé* - Sateré-Mawé Indigenous Women Association) and AMARN (freely translated as *Associação das Mulheres do Alto Rio* Negro - Upper *Rio Negro* Women's Association). Indigenous data were collected at the headquarters of the Waikirú, Bayaroá and Y'apyrehyt (Sateré-Mawé) associations and at the AMARN headquarters, which represents the *Rio Negro* ethnic groups.

Recruitment and data collection of non-indigenous study participants were conducted in the areas of residence of indigenous participants, in Primary Health Care Units and in two of the city's four polyclinics, one located in the North Zone and the other in the East Zone. two areas where most of Manaus's population lives. Individuals who were waiting for a medical appointment or nursing procedure were recruited, and individuals who were waiting for consultation due to cardiovascular disease, including hypertension, were excluded from the study. In addition, it is worth noting that the data collection period coincided with the registration of families for the distribution of milk to parents who had children under two years of age. Thus, we sought to prioritize the invitation to community members who were in the health unit for this registration, rather than presenting signs or symptoms of disease.

Demographic and socioeconomic data (gender, age, time in Manaus, occupation, marital status, number of people per household and religion) were evaluated, with the purpose of characterizing the sample. Regarding cardiovascular risk factors, we evaluated the values of systemic blood pressure (SBP), body mass index (BMI), waist circumference (WC), waist hip ratio (WHR), serum glucose levels, total cholesterol/fractions, as well as smoking and alcohol consumption.

For the casual measurement of SBP, we used an automatic monitor (with an armband for adults or obese individuals, according to arm circumference), model HEM-742INT - OMRON, being considered high pressure when the average of the three measurements was ≥120 and ≥ 80 mmHg[2]. Measurements of the circumferences were performed using a non-elastic tape measure and were considered increased when: neck (WC) ≥ 37 cm men and ≥ 34 cm women; waist (WC) ≥ 94 cm in men and ≥ 80 cm in women. Body fat mass was verified from the ratio WHR and was considered high when ≥ 0.90 in men and ≥ 0.80 in women. To measure weight, we used a portable electronic platform scale and height was measured using a portable stadiometer. BMI was classified according to the following cutoff points: normal or low when < 25, preobese when between 25.0 and 29.9 and obese when ≥ 30[10]. All participants were previously instructed to be fasting for eight hours to collect a 10 ml blood sample. In the biochemical analyzes, the tests with their respective abnormality values adopted were: Blood glucose (≥ 100 mg/dL); Total Cholesterol (≥ 200 mg/dL); HDL (< 40 mg/dL); LDL (≥ 130 mg/dL); VLDL (< 30 mg/dL) and Triglycerides (≥ 150 mg/dL). LDL was calculated by Friedewald's formula (LDL=total cholesterol-HDL-VLDL), where VLDL=triglycerides ÷ 5[11].

Analysis of results, and statistics

A descriptive analysis of the variables of interest was performed according to the Sateré-Mawé, *Rionegrino*, mixed-race/black and white groups. All variables were categorized and compared by Pearson's $\chi 2$ test or Fisher's exact test, when the expected value on a given square was <5. The significance level considered in the tests was $p < 0.05$.

RESULTS

Table 1 presents the demographic, socioeconomic and habits characteristics (alcohol consumption and smoking) of the groups under study. Attention is drawn to the profile of the living conditions of indigenous people, especially the Sateré-Mawé, who seem to be more unfavorable (unemployment, number of people in the household) than the profile of mixed-race/black and white population.

Table 1 - Demographic, socioeconomic and habits characteristics according to race/color and ethnicity, Manaus, Amazonas, Brazil, 2011-2012

Variable	Race/color and ethnicities					*p* value
	Sateré-Mawé	*Rionegrinos*	Mixed-race/blacks	Whites	Total	
	n = 35 (%)	n = 43 (%)	n = 89 (%)	n = 24 (%)	N = 191 (%)	
Sex						**0.016**
Male	16 (45.7)	10 (23.3)	20 (22.5)	11 (45.8)	57 (29.8)	
Female	19 (54.3)	33 (76.7)	69 (77.5)	13 (54.2)	134 (70.2)	
Age group						**< 0.001**
18 – 29 years	15 (42.9)	3 (7.0)	17 (19.1)	9 (37.5)	44 (23.0)	
30 – 39 years	13 (37.1)	8 (18.6)	22 (24.7)	4 (16.7)	47 (24.7)	
40 – 49 years	2 (5.7)	15 (34.9)	21 (23.6)	5 (20.8)	43 (22.5)	
50 – 59 years	2 (5.7)	5 (11.6)	24 (27.0)	4 (16.7)	35 (18.3)	
60 years and +	3 (8.6)	12 (27.9)	5 (5.6)	2 (8.3)	22 (11.5)	
Time in Manaus						**< 0.001**
0 – 15 years	17 (48.6)	21 (48.8)	20 (22.5)	7 (29.2)	65 (34.0)	
16 – 30 years	12 (34.3)	17 (39.5)	31 (34.8)	8 (33.3)	68 (35.6)	
31 years and +	6 (17.1)	5 (11.6)	38 (42.7)	9 (37.5)	58 (30.4)	
Occupation						**< 0.001**
Employed or Retired	19 (54.3)	32 (74.4)	80 (89.9)	21 (87.5)	152 (79.6)	
Unemployed	16 (45.7)	11 (25.6)	9 (10.1)	3 (12.5)	39 (20.4)	
Marital Status						**0.006**
With partner	29 (82.9)	20 (46.5)	59 (66.3)	18 (75.0)	126 (66.0)	
Without partner	6 (17.1)	23 (53.5)	30 (33.7)	6 (25.0)	65 (34.0)	
Religion						**< 0.001**
Evangelical	31 (88.6)	2 (4.7)	40 (44.9)	13 (54.2)	86 (45.0)	
Catholic	4 (11.4)	41 (95.3)	43 (48.3)	9 (37.5)	97 (50.8)	
Others	0 (0)	0 (0)	6 (6.7)	2 (8.3)	8 (4.2)	
People/domicile						**< 0.001**
1 person	4 (11.4)	4 (9.3)	15 (16.9)	1 (4.2)	24 (12.6)	
2 people	8 (22.9)	16 (37.2)	53 (59.6)	13 (54.2)	90 (47.1)	
3 people and +	23 (65.7)	23 (53.5)	21 (23.6)	10 (41.7)	77 (40.3)	
Smoking						**< 0.001**
Never smoked	15 (42.9)	28 (65.1)	55 (61.8)	15 (62.5)	113 (59.2)	
Already smoked	20 (57.1)	5 (11.6)	24 (27.0)	5 (20.8)	54 (28.3)	
Still smokes	0 (0)	10 (23.3)	10 (11.2)	4 (16.7)	24 (12.6)	
Alcohol (the last 7 days)						**< 0.001**
No	30 (85.7)	26 (60.5)	81 (91.0)	17 (70.8)	154 (80.6)	
Yes	5 (14.3)	17 (39.5)	8 (9.0)	7 (29.2)	37 (19.4)	
Alcohol consumption						**< 0.001**
Never drunk	8 (22.9)	36 (83.7)	22 (24.7)	10 (41.7)	76 (39.8)	
Already drunk	15 (42.9)	3 (7.0)	25 (28.1)	9 (37.5)	52 (27.2)	
Still drinks	12 (34.3)	4 (9.3)	42 (47.2)	5 (20.8)	63 (33.0)	

Table 2 – Anthropometric, metabolic and blood pressure variables by race/color and ethnicity, Manaus, Amazonas, Brazil, 2011-2012

Variable	Race/color and ethnicities					*p* value
	Sateré-Mawé n = 35 (%)	*Rionegrinos* n = 43 (%)	Mixed-race/ blacks n = 89 (%)	Whites n = 24 (%)	Total N = 191 (%)	
*BMI						0.008
Normal or low	17 (48.6)	17 (39.5)	19 (21.3)	5 (20.9)	58 (30.4)	
Preobese	15 (42.9)	18 (41.9)	37 (41.6)	12 (50.0)	82 (42.9)	
Obese	3 (8.6)	8 (18.6)	33 (37.1)	7 (29.2)	51 (26.7)	
*WC Men						0.036
Normal	13 (81.2)	9 (90.0)	9 (45.0)	6 (54.50)	37 (64.9)	
Increased	3 (18.8)	1 (10.0)	11 (55.0)	5 (45.50)	20 (35.1)	
*WC Women						0.038
Normal	12 (63.2)	9 (27.3)	20 (29.0)	5 (38.5)	46 (34.3)	
Increased	7 (36.8)	24 (72.7)	49 (71.0)	8 (61.5)	88 (65.7)	
*WHR Women						0.047
Normal	6 (31.6)	3 (9.1)	21 (30.4)	5 (38.5)	35 (26.1)	
Increased	13 (68.4)	30 (90.9)	48 (69.6)	8 (61.5)	99 (73.9)	
▲SBP						0.008
Normal	25 (71.4)	23 (53.5)	35 (39.3)	9(37.5)	92 (48.2)	
▲PreSAH /SAH	10 (28.6)	20 (46.5)	54 (60.7)	15 (62.5)	99 (51.8)	
Total Cholesterol						**<0.001**
Acceptable	34 (97.1)	21 (48.8)	57 (64.0)	19 (79.2)	131 (68.6)	
Borderline/high	1 (2.9)	22 (51.2)	32 (36.0)	5 (20.8)	60 (31.4)	
†HDL						0.011
Normal/great	19 (54.3)	33 (76.7)	42 (47.2)	11 (45.8)	105 (55.0)	
Low	16 (45.7)	10 (23.3)	47 (52.8)	13 (54.2)	86 (45.0)	
†LDL						**<0.001**
Acceptable	34 (97.1)	18 (41.9)	60 (67.4)	16 (66.7)	128 (67.0)	
Borderline/high	1 (2.9)	25 (58.1)	29 (32.6)	8(33.3)	63 (33.0)	
†VLDL						0.002
Normal/great	4 (11.4)	12 (27.9)	41 (46.1)	7 (29.2)	64 (33.5)	
Low	31 (88.6)	31 (72.1)	48 (53.9)	17 (70.8)	127 (66.5)	
Triglycerides						**0.001**
Normal	31 (88.6)	32 (74.4)	48 (53.9)	17 (70.8)	128 (67.0)	
Borderline/high	4 (11.4)	11 (25.6)	41 (46.1)	7 (29.2)	63 (33.0)	
Fasting Blood Glucose						0.036
Normal	35 (100.0)	35 (81.4)	71 (79.8)	21 (87.5)	162 (84.8)	
▪Tolerance/DM	0 (0.0)	8 (18.6)	18 (20.2)	3 (12.5)	29 (15.2)	

*Note: *BMI - Body Mass Index; *WC - Waist Circumference; *WHR – Waist-to-Hip Ratio; ▲SBP - Systemic Blood Pressure; ▲PreSAH/SAH - Prehypertension/Systemic Arterial Hypertension; †HDL - High Density Lipoproteins; †LDL - Low Density Lipoproteins; †VLDL - Very Low Density Lipoproteins; ▪Tolerance/DM - Decreased glucose tolerance/Diabetes Mellitus.*

Table 2 presents the anthropometric, metabolic and blood pressure variables of the groups investigated, showing a worse profile for mixed-race and black group and a better profile for Sateré-Mawé. Aside from the high rate of preobese in all groups, the combination of indicators outside the normal range is different from one group to another. Mixed-race/black population, with a high percentage of individuals having abnormally high or abnormally low values (depending on the indicator) in eight of the eleven variables, is the group with the worst situation. In contrast, the Sateré-Mawé have only one variable with a high percentage in the risk category, with a large difference with the *Rionegrinos* who are most similar to the two non-indigenous groups.

DISCUSSION

In this study, it was found that the prevalence of hypertension among indigenous people was lower than that of whites and mixed-race/black population, as well as the prevalence found in studies conducted in the Brazilian population[3-4,6-7,12].

It is noteworthy that SAH was even lower than studies conducted with indigenous people living in the various Brazilian regions. Among the Kaingang, the prevalence of hypertension suggestive of hypertension was 53.2% among men and 40.7% among women (p=0.02)[13]. SAH was also lower in other countries, pointing out that the high prevalence is associated with the adoption of western eating habits, sedentary lifestyle, increased life expectancy and urbanization process of the population[8,14–16].

A study of northeastern indigenous populations affected by the rapid urbanization process showed higher risk of cardiovascular mortality[17-18]. From the findings, we can consider that there is a possibility that the indigenous of Manaus were not so affected by the urbanization process, because they managed to maintain a way of life close to that they had in indigenous lands. In fact, in the case of the Sateré Mawé, mechanisms and strategies of "indigenization of the city"[9] were created involving a network of practices and social relations that allow the maintenance of the traditional way of life or its reinvention, such as the disposition of houses around a central social space where they perform community activities, including rituals. This would explain the better BMI values between the Sateré-Mawé and *Rio Negro* indigenous compared to the indigenous from other regions of Brazil and from other countries for which obesity is a frequent problem. As an example, a study identified overweight in 66% of Xingu indigenous, in which 52% were classified as abdominal obesity. Similarly, the Kaingang and Guarani indigenous were mostly classified as obese[19]. In the comparison by gender, studies showed that women of the Xavante ethnic group had the highest BMI over 30kg/m^2, as well as the indigenous women of the Kaiowá, Guarani and Terena ethnic groups from the Jaguapiru village, who were obese in the highest proportion (30 %) compared to men (14%)[20-21].

It is noteworthy that the highest percentages of individuals with DM or glucose intolerance were between mixed-race/black population and *Rionegrinos*, while no Sateré-Mawé population showed abnormalities in blood glucose. A study carried out with indigenous Xavante ethnic groups identified high prevalence of high cardiovascular risk, highlighting blood glucose values as one of the indicators that presented higher percentages, especially among women (70.2%)[20].

When comparing the metabolic and anthropometric profile of the Aruák indigenous (Mehinaku, Waurá and Yawalapetí) from the Upper Xingu, Gimeno *et al*. noted that this population had high percentages of overweight (66%), abdominal obesity (52%) and dyslipidemia (77.1%). It was suggested that increased percentage

of adipose tissue, reduced prevalence of infectious diseases and changes in eating habits and lifestyle were the main factors contributing to the increase in NCDs in the investigated group[7,12].

The adequate BMI of the indigenous people in this study may explain the favorable values of blood glucose and total cholesterol found, considering that the metabolic changes are explained by the increase in BMI, physical inactivity and or irregular physical activity. Among the Mura indigenous, whose prevalence of SAH was 26%, more than half of the study participants were overweight and sedentary. The findings indicate that the group probably adopted inappropriate habits and lifestyles, requiring actions aimed at controlling cardiovascular risk factors and associated diseases[19].

Studies conducted with indigenous people living in other countries also presented differences in risk factor profiles for the development of CVD when compared to non-indigenous people. The results showed that, in Australia, the absolute risk for CVD in indigenous people followed for a period of 20 years increased as waist circumference and age values also increased[16]. In Canada, study showed interethnic differences. Among them, the lower prevalence of heart disease, diabetes, and hypertension in the Inuit group was attributed to greater adherence to traditional lifestyles, while indigenous people living in southern Canada had higher prevalence[14].

The frequency of hypertension and cardiometabolic risk factors is noticeably low in the present study, which can probably be explained by the similarity of life habits with those of the villages.

When evaluating, in this study, a group of urban indigenous people who maintained their weight in adequate borderlines, it was not observed the increase of cardiovascular risk factors presented in other urban or village indigenous groups evaluated in other studies in Brazil.

Study limitations

The main limitation of the study is the convenience sample, which was necessary due to the large dispersion of the indigenous population in the city, associated with a very small total population within the general population of the city. Despite this difficulty in recruiting indigenous subjects, their strong bond with their associations allowed them to be recruited. The total sample of indigenous subjects was not large, but the statistical tests were valid.

Contributions to nursing, health or public policy

These results draw attention to the most vulnerable groups due to a risk factor little taken into consideration in the literature, the color/race factor and also ethnicity and, therefore, about the importance of greater incorporation of this variable in the information systems. From now on, it is recommended that nursing teams make efforts not to omit these characteristics when approaching patients with abnormal biological values. The study also shows the need for further investigations in this perspective, with larger and representative samples, considering that comparative studies of color/race and ethnicity groups on health conditions in urban areas are still scarce.

CONCLUSIONS

The findings indicate that, in relation to cardiovascular risk factors, the main differences identified between the groups were obesity, dyslipidemia, preSAH/SAH and increased circumferences, indicating mixed-race/black group as the most vulnerable. It is noteworthy that *Rionegrinos* presented an anthropometric, metabolic and blood pressure profile similar to those of non-indigenous people, indicating more prevalent cardiovascular risk factors than in the Sateré-Mawé.

ACKNOWLEDGMENT

A special thanks to the AMISM (freely translated as *Associação das Mulheres Indígenas Sateré-Mawé* - Sateré-Mawé Indigenous Women Association), Waikirú, Bayaroá, Yápyrehyt (all Sateré-Mawé ethnicity) indigenous associations, and AMARN (freely translated as *Associação das Mulheres do Alto Rio Negro* - Upper *Rio Negro* Women's Association) for their collaboration in communicating and locating indigenous subjects and for the provision of collection site.

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