

LEVEL OF PHYSICAL ACTIVITY IN PEOPLE WITH SYSTEMIC ARTERIAL HYPERTENSION

NÍVEL DE ATIVIDADE FÍSICA EM PESSOAS COM HIPERTENSÃO ARTERIAL SISTÊMICA

NIVEL DE ACTIVIDAD FÍSICA EN PERSONAS CON HIPERTENSIÓN ARTERIAL SISTÉMICA

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Objective: to evaluate the level of physical activity among people with systemic arterial hypertension. **Method:** a descriptive study with a quantitative approach, conducted at a health center in the city of Salvador, Bahia, with the participation of 220 people with a medical diagnosis of systemic arterial hypertension. The participants' physical activity level at work, commuting to work, household chores and free time was investigated based on the International Physical Activity Questionnaire and on the following classification: very active, active, irregularly active and sedentary. A descriptive analysis was performed to characterize the study population. **Results:** a sedentary behavior predominated in all physical activity indicators evaluated by the International Physical Activity Questionnaire. **Conclusion:** knowing the severity of systemic arterial hypertension and the need for physical activity for prevention and control requires greater surveillance and more strategies, respectively, to better understand the magnitude and modify the sedentary behavior that predominates in people with this disease.

Descriptors: Hypertension. Sedentary Behavior. Lifestyle. Risk Factors.

Objetivo: avaliar o nível de atividade física entre pessoas com hipertensão arterial sistêmica. *Método:* estudo descritivo, de abordagem quantitativa, realizado em um multicentro de saúde da cidade de Salvador, Bahia, com participação de 220 pessoas com diagnóstico médico de hipertensão arterial sistêmica. Investigou-se nível de atividade física dos participantes no trabalho, no trajeto de deslocamento, nas tarefas domésticas e no tempo livre com base no Questionário Internacional de Atividade Física e na classificação: muito ativos, ativos, irregularmente ativos e sedentários. Realizou-se análise descritiva para caracterizar a população do estudo. *Resultados:* predominou comportamento sedentário em todos os indicadores de atividade física avaliados pelo Questionário Internacional de Atividade Física. *Conclusão:* conhecendo a gravidade da hipertensão arterial sistêmica e a necessidade da atividade

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física para prevenção e controle, é necessária maior vigilância e mais estratégias para, respectivamente, melhor compreender a magnitude e modificar o comportamento sedentário que predomina em pessoas com essa doença.

Descritores: Hipertensão. Comportamento Sedentário. Estilo de Vida. Fatores de Risco.

Objetivo: evaluar el nivel de actividad física en personas con hipertensión arterial sistémica. Método: estudio descriptivo con enfoque cuantitativo realizado en un multicentro de salud de la ciudad de Salvador, Babía, con la participación de 220 personas con diagnóstico médico de hipertensión arterial sistémica. Se investigó el nivel de actividad física de los participantes en el trabajo, en los viajes para ir y volver del trabajo, en las tareas domésticas y en el tiempo libre, sobre la base del Cuestionario Internacional de Actividad Física y de la siguiente clasificación: muy activos, activos, activos irregularmente y sedentarios. Se efectuó un análisis descriptivo para caracterizar a la población del estudio. Resultados: se registró un predominio del comportamiento sedentario en todos los indicadores de la actividad física evaluados por el Cuestionario Internacional de Actividad Física. Conclusión: al conocer la gravedad de la hipertensión arterial sistémica y la necesidad de la actividad física para su prevención y control, se necesitan, respectivamente, más supervisión y más estrategias para comprender mejor la magnitud y modificar el comportamiento sedentario que predomina en las personas que padecen esta enfermedad.

Descritores: Hipertensión. Comportamiento Sedentario. Estilo de Vida. Factores de Riesgo.

Introduction

Non-communicable chronic diseases (NCCDs) are responsible for the global mortality leading cause (63%). Their prevalence grows alarmingly in the population. Among them, Systemic Arterial Hypertension (SAH) occurs more frequently, estimated at around 1.13 billion people in the world, that is, 30 to 45% of the adult population has this disease⁽¹⁻²⁾.

Despite diagnosis and treatment advances, among NCCDs, SAH is still responsible for most mortality and disability worldwide, causing 54% of cerebrovascular diseases, 47% of ischemic heart disease and assuming 13% of deaths each year. It is estimated that by 2025, the prevalence of SAH in the world will increase by 15-20%, reaching a population of 1.5 billion people⁽²⁾.

In Brazil, the prevalence of hypertension is 31.0%, reaching 32.5% of adults and over 60% of the elderly, contributing to 50% of deaths caused by cardiovascular disease⁽³⁾. It is estimated that the overall prevalence in Brazil will reach 40% by 2025⁽⁴⁾. In the capital of Bahia, Salvador, the percentage of adults who report having SAH is 27.3%. In the same city, there is a percentage of women with hypertension equivalent to 28.7%; for men, this percentage reaches 21.1%⁽⁵⁾.

This disease is directly linked to metabolism disorders, changes in function and structure of target organs and is aggravated by several risk factors⁽³⁾. The occurrence of SAH alone is very

rare. It occurs most often associated with other cardiovascular disease (CVD) risk factors⁽²⁾.

There is evidence in the scientific literature about the existence of several risk factors that contribute to SAH⁽¹⁾. Studies are drawing increasing attention to the relationship between socioeconomic disparities and the prevalence of SAH⁽⁶⁻⁸⁾. They warn that socioeconomic context inequalities may imply other differences regarding access to health services and receiving the necessary guidance and care for their prevention and control⁽⁹⁻¹⁰⁾.

In addition to the socioeconomic factors, physical inactivity is the fourth most prevalent risk factor in the population and is responsible for the world's second leading cause of death, considered one of the biggest public health problems. It causes a mean of 3.2 million deaths each year^(3,11). Physical inactivity is a lifestyle trend that contributes to the maintenance of CVDs as Brazil's leading cause of mortality since the late 1960s. This results from the energy expenditure decrease provided by the behavioral factor⁽¹²⁾.

Physically inactive adults have an increased mortality risk of around 20-30% for all causes compared to those who perform at least 150 minutes of weekly physical activity⁽⁶⁾. Studies show that 46% of the adult population is insufficiently active⁽³⁾.

Complementing this information, a percentage of 31.8% in the 27 Brazilian state capitals together indicates the percentage of adults ≥ 18 years old who accumulate at least 150 minutes of weekly moderate physical activity in their free time. In Salvador's population, the percentage of adults ≥ 18 years old who accumulate this minimum weekly moderate physical activity time in their free time is 14.5%. When insufficiently physically active adults in this city were evaluated, the percentage found is 41.5%⁽⁵⁾.

The adoption of better life habits, such as the practice of regular physical activity, is currently considered in worldwide discussions as an effective method for the prevention of various diseases⁽²⁾. Among them, it contributes to prevent and treat NCCDs like CVD, Diabetes Mellitus, Stroke, Overweight, and Obesity, as well as SAH, promoting health, quality of life and well-being⁽¹³⁾.

The regular development of physical activities, even at a lower intensity, can contribute to the prevention and control of SAH, and is therefore beneficial for the 20% decrease in the world mortality rate⁽¹⁴⁾. The level of regular physical activity enables the risk of developing SAH to be reduced in about 30% of people when compared to the condition of physical inactivity, as the increase directly implies a reduction in blood pressure (BP)⁽³⁾.

Individuals who do not practice regular physical activity are twice as likely to have coronary complications as compared to individuals who perform regular physical activity. Similarly, there is a higher probability of presenting AMI, especially in the presence of other associated risk factors such as SAH⁽¹⁵⁾.

In this context, the present study aims to evaluate the level of physical activity among people with systemic arterial hypertension.

Method

This is a descriptive study with a quantitative approach. It is a thematic clipping of a matrix research developed at the Universidade Federal da Bahia, entitled "The Impact of the Social Determinants on Health in the Prevention

and Control of Cardiovascular Risk Factors in Hypertensive People".

The research was conducted from July to December 2017, in a health multi-center of a Salvador's populous neighborhood, of African descent and culture, which serves people who attend the Chronic Diseases Service of the Unified Health System for the care of hypertensive and diabetic patients. The service is complimentary to the primary health care network and also offers medical care in the following specialties: general practice, orthopedics, pediatrics, gynecology, ophthalmology, endocrinology, among others. Besides, it offers nutritionist, psychologist and social worker services.

The study population corresponded to people of both genders with a medical diagnosis of Systemic Arterial Hypertension (ICD: I-10) attended in the described health multi-center. In order to find the proportion of people over the age of 18 who are attended in the health center and diagnosed with SAH, the simple random sample without replacement was calculated using the STATA software version 11. For this, the prevalence of 25.7% of AH was adopted in people over 18 years old based on the results revealed by the Vigitel Survey in 2014⁽⁵⁾, assuming a sampling error of 5% ($d=0.05$) under the confidence level of 95%. The denominator used was the total number of individuals enrolled in the Hypertensive and Diabetic Registration and Follow-up System of the National Hypertension and Diabetes Mellitus Program (Hiperdia). By calculation, the sample size was 220 people with a medical diagnosis of SAH.

The inclusion criteria were the following: people with a medical diagnosis of SAH who attended the health center for consultations and medication withdrawal through prescription, during the data collection period, and who were aged 18 years old or older. The exclusion criteria were defined as follows: pregnant women, people with motor sequelae and affected by psychiatric and/or cognitive disorders through the previous diagnosis. The study participants were randomly selected while awaiting consultation in the Hiperdia program and/or drug dispensing at the pharmacy.

Data was collected through a structured interview of the matrix research, which was guided by an instrument with closed and semi-structured questions. In the instrument, data regarding the social determinants of health were investigated: gender, age in years old, self-declared race/skin color, responsible or head of household, schooling level of the responsible or head of household, monthly family income, number of people dependent on this income, place and housing conditions, as well as marital status.

The International Physical Activity Questionnaire (IPAQ) was used to investigate physical activity data. This questionnaire investigates the level of physical activity developed at work, commuting, household chores and free time based on the following items: frequency (days of the week), duration (time per day) and intensity (mild, moderate and vigorous). According to the questionnaire, people are classified as very active, active, irregularly active and sedentary. These last two threats are considered as risks for the individual.

Data was coded and entered into the Statistical Package for the Social Sciences (SPSS), version 21.0, for treatment and generation of the results. Descriptive analyses were performed to characterize the study population. The variables studied were presented descriptively in tables containing absolute (n) and relative (%) frequencies.

The matrix research that originated this study has Approval Opinion No. 1,182,032, dated 5/6/2015, from the Research Ethics Committee (Comitê de Ética em Pesquisa, CEP) of the Nursing School of the Federal University of Bahia.

The ethical principles approved by Resolution No. 466 of December 2012, Resolution No. 510 of April 2016, and Resolution No. 580 of March 2018, all of the National Health Council, which regulate research involving human subjects, were respected. The four basic principles of bioethics of non-maleficence, justice, beneficence, and autonomy were also respected.

All research participants were previously informed about the research objectives, justifications, as well as benefits and risks that involved their participation in the study. The consent of each participant was obtained.

Results

The sample consisted of 220 people with AH. There was female supremacy (78.6%); the mean age was 59.4 years old (SD=11.3), with predominance of the age group older than or equal to 60 years old (53.6%); black and brown-skinned (91.4%); complete high school (55.0%); monthly family income of one to two minimum wages (48.6%); and being with a partner (77.7%).

Regarding the level of physical activity, according to the IPAQ criteria, sedentary behavior predominated in the following sections: work (93.6%), ways of transport (84.1%), household chores (75.5%), leisure (97.3%). In the time spent sitting, people were classified, in greater proportion, as insufficiently active (43.6%), as shown in Table 1. Therefore, according to the percentages found for a sedentary lifestyle, there was a predominance of sedentary/insufficiently active behavior in all the indicators of physical activity.

Table 1 – Physical activity level of people with systemic arterial hypertension. Salvador, Bahia, Brazil – Jul.-Dec. 2017 (N=220)

Indicators of physical activity	Classification of the level of physical activity		
	Active n (%)	Sedentary n (%)	Insufficiently active n (%)
Physical activity at work	14 (6.4)	206 (93.6)	-
Physical activity as a means of transportation	4 (1.8)	185 (84.1)	31 (14.1)
Physical activity at home	31(14.1)	166 (75.5)	23 (10.5)
Leisure physical activity	-	214 (97.3)	6 (2.7)
Time spent sitting	34 (15.5)	90 (40.9)	93 (43.6)

Source: Created by the authors.

Note: Conventional signal used:

- Numeric data equal to zero not resulting from rounding.

Discussion

The analysis of the population's socioeconomic characteristics showed a predominance of women. Despite the decrease in the number of women with SAH in recent years, as noticed in the scientific literature, the self-reported prevalence in the world population is higher in women when compared to men. Women are more prone to increased risk of cardiovascular events due to elevated BP. However, it is curious to highlight that a higher level of awareness about SAH is being observed in women, as well as the assistance in the health services is more prevalent in females⁽¹⁶⁾.

Differently from the Brazilian reality, in the United States, a research study developed to evaluate trends in SAH control from 1999 to 2016 by gender found a male predominance of SAH, reporting a decreasing prevalence during these years, while for women, there was no change in disease prevalence⁽¹⁷⁾.

Regarding the age group, there was a predominance of people over 60 years old who most suffer from SAH. A study developed in Africa corroborates this result, which also presented a higher percentage of people with hypertension in this age group and attributed to aging the condition of contributing factor in increasing the burden of this disease in the country⁽¹⁸⁾. The patients most affected by SAH are elderly⁽¹⁹⁾.

This predominance of elderly people with SAH may be related to the increased resistance of blood vessels and consequent arterial stiffness that occurs with advancing age, beginning between 20 and 30 years old, and intensifying between 30 and 50 years old⁽²⁰⁾. This biological basis for elderly BP elevation, due to arterial stiffness, implies several complications for the heart structure and function. Also, with age advancing, there is a tendency towards reduced renal function due to the decline of important plasma enzymes, which compromises homeostatic mechanisms and impairs arterial pressure control⁽¹⁸⁾.

Regarding the self-reported race/skin color characteristic, there was a predominance of the afro descent/black and brown-skinned people. This result was to be expected, since the research was developed in an African-descent root and culture neighborhood. A study conducted in 2016 reports the prevalence of SAH in the brown-skinned population⁽²⁰⁾. In another study, conducted in 2017, the prevalence of SAH was also found in black-skinned individuals⁽²¹⁾.

This disease is known worldwide as one of the main problems faced in the public health of the black population, especially in Brazil, as it is the second-largest nation of African descent and, therefore, it has SAH as one of the diseases that most worries them⁽²¹⁾. In the United States (USA), the prevalence of hypertension is 50% higher in African-descent individuals. Moreover, in this ethnic group, the achievement of regular physical activity level as prevention and control of CVDs is less likely⁽²²⁾.

Another study conducted in the USA corroborates this data by reporting that people of African descent are more likely to have SAH and younger than people of other ethnic groups, and are more likely to have uncontrolled BP. These factors contribute to the increased mortality rate due to CVD in African descent people. Moreover, this same study states that racial discrimination is a risk factor for these individuals, an aspect that encompasses racist behaviors, including actions taken in various social places ranging from social distancing to aggression, making them live in constant vigilance, called "vigilant coping strategy", triggering stress-conditioning cardiovascular and psychologic responses⁽²³⁾.

Regarding the levels of schooling in this population, complete high school predominated, followed by incomplete elementary school, that is, very few individuals had an undergraduate level of education. This result is often found in surveys of individuals with SAH^(14,21).

Another study shows that 79% of the individuals with SAH are illiterate or did not complete elementary school. It was also seen in the literature, in a time trend research with

hypertensive people, the predominance of incomplete elementary school, followed by complete elementary school and complete high school⁽²¹⁾, reinforcing, once again, the relationship between low level of education and the disease development and lack of control.

Recent studies have shown that less-educated populations have less access to health services and receive less intensive preventive care, and these factors may mean difficulty in understanding health information and low level of knowledge about the health-disease process, chronic pathologies such as SAH, and their respective prevention and treatment modes, contributing to the lack of control of this disease⁽¹⁰⁾.

Regarding the research participants' income, people were predominant with a monthly income of 1 to 2 minimum wages, followed by an income of less than 1 minimum wage; few had income above 2 minimum wages. These results corroborate other studies, with a variation in the number of monthly minimum wages, such as an income less than one minimum wage⁽²⁰⁾ and an income less than three minimum wages⁽²¹⁾, which suggests vulnerability regarding the socioeconomic condition in hypertensive groups.

A recent study conducted in Africa also discusses the high prevalence of SAH in this continent. It points out that socioeconomic aspects, such as low levels of education and income, contribute to the development, low detection and poor control of this disease, as they interfere with the way individuals lead their lives and adopt daily habits. Poor families tend to be less aware of SAH prevention and control, and therefore tend to achieve worse outcomes from the complications of this disease⁽¹⁸⁾.

Regarding marital status, it was evident that most people with hypertension have a partner. It is suggested that, as people age, they tend to tighten emotional bonds and decide to establish a more serious relationship.

In South Asian countries, studies have been conducted showing the relationship between the socioeconomic differences and the prevalence of SAH, as they observed that low-income less educated people living in disadvantaged neighborhoods were

more likely to develop complications and to die as a consequence of this disease. On the other hand, people who suffered from SAH and had a higher socioeconomic level showed an inverse relationship, when they manifested a better health condition⁽⁶⁻⁸⁾. Thus, it can be understood that the socioeconomic differences may direct individuals to have low access to health care, education, work and leisure, factors that generate serious health damage⁽⁹⁾.

A study conducted in South Korea conjectures that a more disadvantaged socioeconomic condition may interfere with people's lifestyle habits, providing inappropriate eating behavior, stimulating sedentary lifestyle, as well as other inappropriate habits that make it difficult to adopt a healthy lifestyle, developing in the individual, metabolism disorders and diseases such as SAH. Besides, socioeconomically disadvantaged populations have less access to the health services and are less likely to receive appropriate preventive care and guidance⁽¹⁰⁾.

In this study, we highlight the predominance of sedentary/insufficiently active behavior in people with SAH, regarding all the indicators of physical activity evaluated. Inadequate behavioral patterns prevailed in countries such as China and the USA, which are risk factors associated with the development of CVDs, such as SAH⁽²⁴⁾. Importantly, individuals who maintain sedentary behavior are twice as likely to develop a CVD compared to individuals who engage in regular physical activity. Even more worrying: sedentary people with a diagnosis of SAH have a higher chance of complications, especially in the presence of associated cardiovascular risk factors, such as behavioral factors⁽¹⁵⁾.

Lifestyle-related situations, such as physical inactivity/sedentarism, are risk factors that can result in serious consequences for individuals. However, changing this condition may reduce the risk of developing and uncontrolled CVDs, such as SAH, given that the main conduct to prevent and control this disease is to adopt healthy behaviors. The practice of physical activity is a healthy behavior that produces important health benefits, such as a reduction of 5 to 7 mmHg in BP and systolic in people with SAH⁽²⁵⁾.

For people with SAH, it is recommended to practice at least 30 minutes of moderate physical activity daily, continuously or accumulated, at least 5 days a week, and with the possibility of implementing it in various modalities such as walking, running and swimming⁽⁴⁾. However, even in the face of these worldwide guidelines, what was observed was that they were not followed by the individuals with SAH studied. They maintained sedentary habits in all domains of physical activity and, therefore, were more likely to aggravate the disease and their morbi-mortality⁽¹⁴⁾.

Regarding the level of physical activity of the Brazilian population, it is identified that 44.1% do not do sufficient of it. This percentage is higher among women⁽⁵⁾. In this population, 46% of the individuals did not reach 150 minutes of physical activity during the week, including work, home, leisure, and commuting activities. Percentage differences were recorded according to the age group, with the elderly presenting the highest percentage, equivalent to 62.7%⁽³⁾.

Since 1990, Brazil has been implementing intervention policies to promote and encourage physical activity in order to monitor and reduce and/or minimize cardiovascular risk factors. In 2011, actions proposed by the action plan to cope with non-transmissible diseases were consolidated, including objectives to be achieved by 2022, including the prevention of SAH, which is one of the priorities of primary health care⁽¹²⁾.

Among the individuals with a sufficient level of physical activity, the reduction in the risk of developing SAH by 30% is observed when compared to individuals with physical inactivity, as this increase directly implies a reduction in BP⁽³⁾.

Given the complications and mortality resulting from SAH, we observe that, in fact, more in-depth looks are needed by those responsible for formulating public policies, to know closely the reality of each individual within their respective places of residence, so that, based on this knowledge, reality-based health strategies may be evaluated, planted and implemented to promote health inequalities reduction⁽⁶⁾.

Also, public agencies need to invest in appropriate structures in the physical environment of the localities to enable the population to practice physical activity and to facilitate the regular development of walking, running and cycling, as well as other forms of non-motorized physical activity, such as swimming, besides providing opportunities for sports, leisure and recreation activities, which favor an active life for all age groups⁽¹¹⁾.

This study had some limitations, such as the small sample and the fact that it is a group that frequents the health service in a community of predominantly African descent and culture. These aspects may have contributed for the sample to present a majority of black and brown-skinned individuals, making it difficult to consider the race/skin color factor in the study.

Conclusion

The level of sedentarism/insufficient active physical activity predominated among people with SAH who participated in this study. It is noteworthy that physical inactivity prevailed in all domains of physical activity: at work, commuting, at home, leisure and time spent sitting. This reflects the difficulty of adherence to a healthy lifestyle by individuals with this disease and, consequently, a higher risk of causing uncontrolled disease. Therefore, the health services must encourage the practice of physical activity, which requires professionals to pay special attention through educational activities to promote the health of the population with SAH.

Despite the limitations pointed out, the study allowed us to know and evaluate the physical activity level of individuals with SAH and to find inappropriate behaviors regarding this practice, which may present a potential risk for the severity of the disease. Therefore, the results of this study were pertinent to highlight the need for better surveillance and more intervention strategies among individuals with SAH, to better understand the magnitude and stimulate the practice of regular physical activity in order

to modify the sedentary/insufficiently active behavior that predominates in people with this disease.

Also, the results may stimulate further scientific studies on the subject, with further delineations for this investigation, as well as randomized studies with larger samples to better define factors associated with sedentary/insufficiently active behavior observed in individuals with SAH. They will also strengthen the understanding of the need for preventive actions and control of cardiovascular risk factors in public health policies, through health education programs that include relevant and frequent activities to encourage the adoption of a healthier lifestyle among people with SAH, covering the health of all populations and their various socioeconomic characteristics.

Collaborations:

1 – conception, design, analysis and interpretation of data: Cleise Cristine Ribeiro Borges Oliveira, Elieusa and Silva Sampaio and Cláudia Geovana da Silva Pires;

2 – writing of the article and relevant critical review of the intellectual content: Cleise Cristine Ribeiro Borges Oliveira, Maiara da Silva Brandão Rodrigues, Carla Tatiane Oliveira Silva, Cláudia Silva Marinho Antunes Barros, Elieusa and Silva Sampaio and Cláudia Geovana da Silva Pires;

3 – final approval of the version to be published: Cleise Cristine Ribeiro Borges Oliveira, Maiara da Silva Brandão Rodrigues, Carla Tatiane Oliveira Silva, Cláudia Silva Marinho Antunes Barros, Elieusa and Silva Sampaio and Cláudia Geovana da Silva Pires.

References

1. Malta DC, Bernal RTI, Andrade SSCA, Silva MMA, Velasquez-Melendez G. Prevalência e fatores associados com hipertensão arterial autorreferida em adultos brasileiros. *Rev Saúde Pública*. 2017;51(suppl 1):1-11. DOI: 10.1590/s1518-8787.2017051000006
2. Williams B, Mancia G, Spiering W, Agabiti Rosei E, Azizi M, Burnier M, et al. 2018 ESC/ESH Guidelines for the management of arterial hypertension. *Eur Heart J*. 2018 Sep;39(33):3021-104. DOI: 10.1093/eurheartj/ehy339
3. Sociedade Brasileira de Cardiologia. 7th Brazilian Guideline of Arterial Hypertension. *Arq Bras Cardiol* [Internet]. 2016;107(Supl.3):1-83. DOI: <http://dx.doi.org/10.5935/abc.20160152>
4. Silva EC, Martins MSAS, Guimaraes LV, Segri NJ, Lopes MAL, Espinosa MM. Prevalência de hipertensão arterial sistêmica e fatores associados em homens e mulheres residentes em município da Amazônia Legal. *Rev Bras Epidemiol*. 2016;19(1):38-51. DOI: 10.1590/1980-5497201600010004
5. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. *Vigitel Brasil 2017. Vigilância de Fatores de Risco e Proteção para Doenças Crônicas por Inquérito Telefônico* [Internet]. Brasília, DF; 2018. [cited 2019 Sep 5]. Available from: https://bvsms.saude.gov.br/bvs/publicacoes/vigitel_brasil_2017_vigilancia_fatores_riscos.pdf
6. Cho KH, Lee SG, Nam SM, Lee EJ, Jang SY, Lee SH, et al. Disparities in socioeconomic status and neighborhood characteristics affect all-cause mortality in patients with newly diagnosed hypertension in Korea: a Nationwide cohort study, 2002-2013. *Int J Equity Health*. 2016;15(3):1-9. DOI: 10.1186/s12939-015-0288-2
7. Jeon Y, Kim CR, Park J, Choi K, Kang MJ, Gunk PS, et al. Health inequalities in hypertension and diabetes management among the poor in urban areas: a population survey analysis in south Korea. *BMC Public Health*. 2016;16(492):1-9. DOI: 10.1186/s12889-016-3169-8
8. Gupta R, Kaur M, Islam S, Mohan V, Mony P, Kumar R, et al. Association of Household Wealth Index Educational Status and Social Capital with Hypertension Awareness, Treatment, and Control in South Asia. *Am J Hypertens*. 2018;30(4):373-81. DOI: 10.1093/ajh/hpw169
9. World Health Organization. Closing the gap in a generation. Health equity through action on the social determinants of health. Commission on Social Determinants of Health, final report. Geneva; 2008.
10. Lee H. Socioeconomic disparities in the prevalence diagnosis, and control of hypertension in the context of a universal health insurance system. *J Korean Med Sci*. 2017;32:561-7. DOI: 10.3346/jkms.2017.32.4.561
11. World Health Organization. Global Status Report on noncommunicable diseases 2014. Geneva; 2014.

12. Ribeiro AL, Duncan BB, Brant LC, Lotufo PA, Moinho JG, Barreto SM. Cardiovascular health in Brazil: trend and perspectives. *Circulation*. 2016;133(4):422-33. DOI: 10.1161/CIRCULATIONAHA.114.008727
13. World Health Organization. Plano de ação global para atividade física 2018-2030: mais pessoas ativas para um mundo mais saudável. Geneva; 2018.
14. Carvalho CJ, Marins JCB, Amorim PRS, Fernandes MS, Reis HHT, Sales SS, et al. Altas taxas de sedentarismo e fatores de risco cardiovascular em pacientes com hipertensão arterial resistente. *Medicina (Ribeirão Preto)*. 2016;49(2):124-33. DOI: 10.11606/issn.2176-7262.v49i2p124-133
15. Faleiro RC, Quaresma RS, Souza WM, Aquino ES. Avaliação do sedentarismo e risco de eventos cardiovasculares e sua correlação com o teste de caminhada de seis minutos. *Sinapse Múltipla [Internet]*. 2017 [cited 2019 Sep 1];6(2):139-53. Available from: <http://periodicos.pucminas.br/index.php/sinapsemultipla>
16. Gillis EE, Sullivan JC. Sex differences in hypertension: recent advances. *Hypertens*. 2016;68(6):1322-7. DOI: 10.1161/HYPERTENSIONAHA.116.06602
17. Ostchega Y, Zhang G, Hughes JP, Nwankwo T. Factors Associated with hypertension control in US adults using 2017 ACC/AHA guidelines: National Health and Nutrition Examination Survey 1999-2016. *Am J Hypertens*. 2018;31(8):886-94. DOI: 10.1093/AJH/HPY047
18. Bosu WK, Aheto JMK, Zucchelli E, Reilly ST. Determinants of systemic hypertension in older adults in Africa: a systematic review. *BMC Cardiovasc Disord*. 2019;19(1):173. DOI: 10.1186/s12872-019-1147-7
19. Alves TA, Sousa BVN, Jesus VS, Camargo CL. Hipertensão arterial: conhecimento de jovens quilombolas. *Rev Bras Saúde Func [Internet]*. 2016 [cited 2019 Sep 1];1(1):39-49. Available from: <http://www.seer-adventista.com.br/ojs/index.php/RBSF/article/view/713>
20. Silva EC, Martins MSAS, Guimarães LV, Segri NJ, Lopes MAL, Espinosa, et al. Prevalência de hipertensão arterial sistêmica e fatores associados em homens e mulheres residentes em município da Amazônia Legal. *Rev bras epidemiol*. 2016;19(1):38-51. DOI: <http://dx.doi.org/10.1590/1980-5497201600010004>
21. Lobo LAC, Canuto R, Dias-da-Costa JS, Pattussi MP. Tendência temporal da prevalência de hipertensão arterial sistêmica no Brasil. *Cad Saúde Pública*. 2017;33(6):1-13. DOI: 10.1590/0102-311x00035316
22. Egan BM. Physical activity and hypertension. Knowing is not enough; we must apply. Willing is not enough; we must do-von goethe. *Hypertens*. 2017;69:404-6. DOI: 10.1161/HYPERTENSIONAHA.116.08508
23. Hines AL, Pollack CE, LaVeist TA, Jr Thorpe RJ. Race, Vigilant Coping Strategy, and Hypertension in an Integrated Community. *Am J Hypertens*. 2018;31(2):197-204. DOI: 10.1093/ajh/hpx164
24. Yi SS, Thorpe LE, Zanolwjak JM, Trinh-Shevrin C, Islam NS. Clinical characteristics and lifestyle behaviors in a population-based sample of Chinese and South Asian immigrants with hypertension. *Am J Hypertens*. 2018;29(8):941-7. DOI: 10.1093/ajhqhpw014
25. Hegde SM, Solomon SD. Influence of physical activity on hypertension and cardiac structure and function. *Curr Hypertens Rep*. 2015;17(10):1-13. DOI: 10.1007/s11906-015-0588-3

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