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Barriers to physical activity practice and associated factors in patients with hypertension

Barreiras para a prática de atividade física e fatores associados em pacientes com hipertensão arterial

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Abstract – The identification of barriers to regular physical activity (PA) is a form of an initial and effective strategy to encourage behavior modification and adherence to a more active lifestyle in hypertensive patients. This cross-sectional study aimed to identify the barriers to PA practice in patients with hypertension classified as physically inactive and to analyze the association of the number of these barriers with sociodemographic factors and health indicators. Two hundred one hypertensive patients of both sexes (61.7±12.7 years) answered an anamnesis with health information and sociodemographic data, a PA level questionnaire, and a barrier questionnaire for the practice of PA. Regarding the level of PA of the participants, 48.8% were classified as physically inactive and reported, on average, 6.1 (±3.8) barriers to PA practice, with the barrier "fear of falling or getting hurt" the most commonly reported. Furthermore, women and patients with low education, negative perception of health, and a greater presence of comorbidities reported a greater number of barriers to PA practice. PA practice as a non-pharmacological tool for the treatment of hypertension should focus on women and patients with low education, negative perception of health, and a greater presence of associated comorbidities.

Key words: Exercise; Cardiovascular diseases; Chronic diseases.

Resumo – *A identificação de barreiras à atividade física regular (AF) é uma forma de estratégia inicial e eficaz para encorajar a modificação do comportamento e a adesão a um estilo de vida mais ativo em pacientes hipertensivos. Este estudo transversal visou identificar as barreiras à prática de AF em pacientes com hipertensão classificados como fisicamente inativos e analisar a associação do número destas barreiras com fatores sociodemográficos e indicadores de saúde. Duzentos e um pacientes hipertensos de ambos os sexos (61.7±12.7 anos) responderam a uma anamnese com informações de saúde e dados sociodemográficos, um questionário de nível de AF, e um questionário de barreira para a prática de AF. Relativamente ao nível de AF dos participantes, 48,8% foram classificados como fisicamente inativos e reportaram, em média, 6,1 (±3,8) barreiras à prática de AF, sendo a barreira "medo de cair ou de se magoar" a mais frequentemente reportada. Além disso, mulheres e pacientes com baixa educação, percepção negativa da saúde, e uma maior presença de comorbidades reportaram um maior número de barreiras à prática de AF. A prática de AF como ferramenta não farmacológica para o tratamento da hipertensão deve ter como foco mulheres e pacientes com baixa escolaridade, percepção negativa de saúde e maior presença de comorbidades associadas.*

Palavras-chave: *Exercício; Doenças cardiovasculares; Doenças crônicas.*

INTRODUCTION

The worldwide prevalence of hypertension is 34%[1]. In Brazil, it affects about 32.5% of adults and more than 60% of the elderly[2]. Hypertension is a multifactorial condition associated with metabolic disorders and changes in functionality and/or structure of target organs, being one of the main risk factors for global mortality and responsible for about 50% of deaths related to cardiovascular diseases (CVD)[1,2].

The non-pharmacological treatment of hypertension includes, among other aspects, the regular practice of physical activity (PA)[2,3]. However, although there are evidences of the benefits of PA in the control of hypertension[4-6], the prevalence of sufficient PA practice among hypertensive patients is low (~31%)[7]. Therefore, it is necessary to identify the barriers to PA in this population and, thus, establish strategies that allow the increase of PA levels[8].

Barriers are considered reasons that reflect negatively on an individual's decision making[9]. In the treatment of hypertension, barriers are the difficulties encountered by the patient that represent an impediment factor to not continue the treatment determined[10]. Identifying these barriers to the practice of PA and the factors associated with them are important to create an initial and effective strategy to encourage behavior modification and adherence to a more active lifestyle in this population[11,12]. Therefore, this study aimed to identify the barriers to PA practice and to analyze their association with sociodemographic factors and health indicators in patients with hypertension classified as physically inactive.

METHOD

Sample

This is a cross-sectional study carried out between May and October 2019. The sample consisted of adults, of both sexes, treated at a cardiology outpatient clinic of a university hospital. The project was approved by the local Ethics Committee (number 3.198.368).

As inclusion criteria, all participants should be ≥ 18 years of age, have a medical diagnosis of hypertension[2], and not have physical disabilities that would hinder the performance of PA.

Procedures

Patients were approached in the outpatient clinic and invited to participate in the study. After being informed of the study procedures, participants signed a free and informed consent form. Subsequently, the participants answered an anamnesis containing information regarding their sociodemographic and health data, a questionnaire to assess the level of PA, and a questionnaire of barriers to PA practice. Also, the body mass and height were measured.

Anamnesis and description of variables

Questions were asked regarding sociodemographic and health data. To identify state of health, the patients were asked about their perception of the current state of health, using the following options as answers: "great", "good", "regular", "bad" or "very bad". Moreover, patients were asked about the presence of diseases other than hypertension, the time of hypertension diagnosis, and what medications they used in their treatment.

Education was classified as "low" (up to incomplete elementary school) and "high" (completed elementary school or more). Furthermore, the health status indicated as "great" and "good" were classified as "positive", while those identified as "regular", "bad" and "very bad" were classified as "negative".

Physical activity level

To assess the level of PA, a short version of the IPAQ[13] was used. Participants were categorized into two groups: "active" (who performed PA for at least 150 minutes/week) and "non-active" (irregularly active and sedentary).

Barriers to physical activity questionnaire

To identify the barriers to PA practice, the questionnaire applied by Murta et al.[8] was adopted. The instrument consists of 18 questions and is categorized into four domains regarding factors associated with: 1) the disease or comorbidities; 2) symptoms or complications of the disease; 3) the practice of physical activity; and 4) social, economic and psychological aspects. The answer options were "yes", if they considered the question a barrier, and "no", if they did not consider the question a barrier to the practice of PA.

Statistical analysis

Continuous data were expressed as mean ($\overline{x}$) and standard deviation (SD), while categorical data were expressed in absolute (n) and relative frequency (%). To analyze the association between the number of barriers to PA practice and sociodemographic factors and health indicators, crude and adjusted linear regressions were performed. The adjustment variables were sex, education, health perception, and number of comorbidities. The level of statistical significance established was $p < 0.05$ and the software used was Statistical Package for the Social Sciences (Version 21.0; IBM Corp., Armonk, NY, USA).

RESULTS

From 343 patients that were invited to participate in this study, 32 refused to participate, 93 had no diagnosis of hypertension, and 17 were excluded according to other eligibility criteria. Finally, 201 patients participated in the study, mostly women (61.7%), aged over 60 years (64.7%), and diagnosed with hypertension more than 10 years ago (69.9%). Most of the sample reported having elementary level education and incomes of up to two minimum wages. The majority of the sample reported using up to three medications to treat hypertension and having up to two diseases besides hypertension, being reported six different diseases. Diabetes was the most reported disease (32.3%), followed by coronary artery disease (23.4%). In regards to the level of PA, 48.8% of the patients were classified as physically non-active. The perception of "regular" health and the presence of up to two comorbidities were the most reported among these patients. Regarding the number of medications used to treat hypertension, most inactive patients reported using three or more medications (Table 1).

Table 1. Sociodemographic and health characteristics of the general sample and physically non-active patients.

Variable	Total patients (n=201)		Non-active patients (n=98)	
	$\bar{x}$	SD	$\bar{x}$	SD
Age (years)	61.7	± 12.7	63.9	± 12.8
Body mass (kg)	82.6	± 21.1	84.8	± 21.4
Height (m)	1.66	± 0.44	1.61	± 0.11
BMI (kg/m2)	31.8	± 7.1	32.3	± 6.5
Time of disease (years)	14.9	± 10.6	16.1	± 11.23
	n	%	n	%
Sex				
Female	124	61.7	58	59.2
Male	77	38.3	40	40.8
Education				
Illiterate	13	6.5	6	6.1
Elementary school	126	62.7	62	63.3
High school	44	21.9	19	19.4
Higher education	18	9.0	11	11.2
Income				
Up to 2 minimum wages*	160	79.6	76	77.6
From 2 to 4 minimum wages	25	12.4	11	11.2
Over 4 minimum wages	10	5.0	7	7.1
Not reported	6	3.0	4	4.1
Health perception				
Great	11	5.5	3	3.1
Good	55	27.4	24	24.5
Regular	88	43.8	41	41.8
Bad	39	19.4	24	24.5
Very bad	8	4.0	6	6.1
Number of medications				
Up to 3 medications	112	55.7	42	42.9
Over 3 medications	89	44.3	56	57.1
Comorbidities				
Up to 2 comorbidities	149	74.1	72	73.5
Over 2 comorbidities	52	25.9	26	26.5

Note: $\bar{x}$ = mean; SD = standard deviation; n = total number; % = percentage; BMI = body mass index. *One minimum wage = R$1,045.00 (≅US$ 203.31).

Considering only patients classified as physically non-active, an average of 6.1 (± 3.8) barriers to PA practice were reported. The barrier "fear of falling or getting hurt" was reported by almost half of these patients (48.0%). Conversely, the barrier "lack of support from family or friends" was the least reported among these patients (7.0%) (Figure 1).

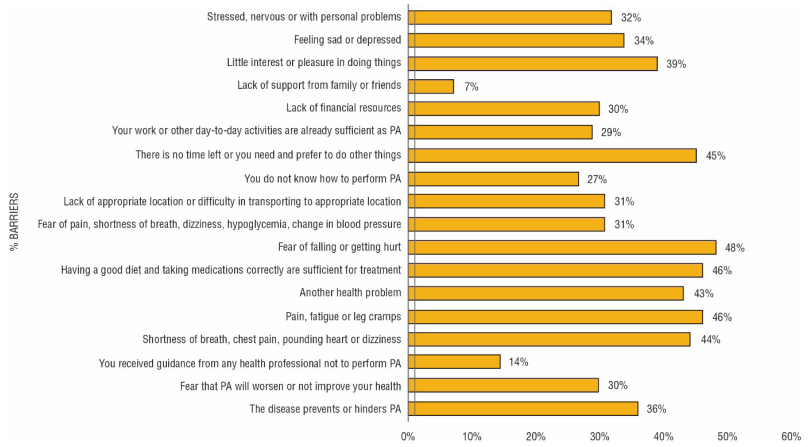

Figure 1. Barriers to the practice of physical activity in physically inactive hypertensive patients (n=98). PA = physical activity.

Table 2 presents the association of the number of barriers to PA practice with sociodemographic factors and health indicators for physically non-active patients. In the crude analysis, male sex, higher education, and positive health perception were factors associated with lower reports of barriers, while the presence of more comorbidities was positively associated with the number of barriers reported ($p < 0.05$). Adjusting for confounders, male sex, higher education, and positive health perception remained negatively associated with the number of barriers reported ($p < 0.05$).

The barrier "having a good diet and taking medications correctly are sufficient for treatment" was the most reported among men (45.0%) and "fear of falling or getting hurt" the most reported among women (65.5%). Among patients with higher education, the barrier "there is no time left or you need and prefer to do other things" was the most reported (40.0%) and among those with lower education, the main barrier was "fear of falling or getting hurt" (60.3%). Concerning health perception, the barriers "there is no time left or you need and prefer to do other things" and "shortness of breath, chest pain, pounding heart or dizziness" were most reported, respectively by patients with positive (55.6%) and negative health perception (56.3%). Regarding the number of comorbidities, patients with up to two and with three or more comorbidities reported, respectively, "having a good diet and taking the medications correctly are sufficient for treatment" (45.8%) and "pain, fatigue or leg cramps" (65.4%) as the main barrier.

Table 2. Crude and adjusted association between the number of barriers to physical activity and sociodemographic factors and health indicators in physically non-active hypertensive patients (n=98).

	Number of barriers			
	Crude analysis		Adjusted analysis*	
	β (95% CI)	p-value	β (95% CI)	p-value
Sociodemographic				
Sex (male)	-0.372 (-4.339; -1.428)[a]	<0.001	-0.242 (-3.245; -0.502)[a]	0.008
Age (years)	0.040 (-0.048; 0.072)	0.692	-	
Education (high)	-0.411 (-4.610; -1.749)[a]	<0.001	-0.286 (-3.588; -0.843)[a]	0.002
Health indicators				
Time of disease (years)	0.097 (-0.037; 0.104)	0.350	-	
Health perception (positive)	-0.331 (-4.450; -1.194)[a]	0.001	-0.202 (-3.231; -0.206)[a]	0.026
Number of comorbidities	0.318 (0.341; 1.379)b	0.001	0.162 (-0.046; 0.923)	0.076

Note: CI = confidence interval; *Adjustment for sex, education, health perception and number of comorbidities; [a]significant negative association for the number of barriers compared of opposed; [b]significant positive association for the number of barriers compared of opposed.

DISCUSSION

The main results of the study indicated a high number of perceived barriers among patients with hypertension classified as physically non-active, mainly related to intrapersonal factors and lack of knowledge about the different strategies of non-pharmacological treatment of hypertension. In addition, a higher report of barriers was identified among women, patients with low educational levels, a negative perception of health, and a higher number of associated comorbidities.

In the present study, it was reported, on average, 6.1 (±3.8) barriers to PA practice. Murta et al.[8] showed a similar result, identifying an average number of barriers among inactive patients of 7.58 (± 3.3). Similarly, Adeniyi et al.[14] reported that the high number of perceived barriers was the main factor of influence on the low levels of PA detected among these patients. Thus, it is believed the

number of barriers reported by patients in the present study is considerable and may influence the level of PA found in this population.

Initially, the most prevalent barrier, "fear of falling or getting hurt", exhibited a strong relationship with the age of individuals, as also demonstrated by Satariano et al.[15], who found that this fear increases with age. Moreover, the characteristics most present in the sample, such as low education levels and low income, may contribute to the existence of limiting beliefs, as exemplified by the most prevalent barrier, "having a good diet and taking the medications correctly are sufficient for treatment", which was also observed by Murta et al.[8]. This seems to indicate the lack of knowledge of the importance of PA practice as a complementary intervention in the treatment of hypertension. It is believed that without the knowledge and a correct perception of this subject, it becomes difficult to make decisions to modify these individuals' behaviors[8]. Also, according to Gebrezgi et al.[16], the individual's knowledge is an important facilitator for the practice of PA.

The third most cited barrier, "pain, fatigue and leg cramps", was also identified as one of the most prevalent in the study by Murta et al.[8] and can be explained by the characteristics of non-communicable diseases (NCDs), including hypertension, which are generally responsible for physiological and morphological changes, that may cause physical limitations and unpleasant sensations to patients[17]. The barrier, "there is no time left or you need and prefer to do other things", was the fourth most reported in the present study and also presented a high prevalence in the study by Rech et al.[18], which reported that most people have difficulty in organizing their activities within the time available and being overloaded with household and professional tasks.

When analyzing the perceived barriers according to sex, women reported a greater number of barriers than men. This association was also found by Silva et al.[19] which, differently from our study, was conducted with physically active individuals. Similarly, Rech et al.[18], when reviewing studies conducted in Brazil with a sample of different age groups, concluded that adult women report a higher proportion of intrapersonal barriers compared to men. It is noteworthy that, in the present study, the most reported barrier among women was "fear of falling or getting hurt" (65.5%), which was also found by Krug et al.[20], involving longevity and physically non-active women.

In addition, we identified that higher education level was associated with lower reporting of barriers to PA practice among patients with hypertension, similar to the results found in studies involving patients with several NCDs[8] or with a peripheral arterial disease[21]. Such results involving the association between a higher number of reported barriers, female sex, and low education level could be explained, partially, by the cultural role of women in society, which is tied to greater dedication to household tasks. Indeed, the greater demand for domestic workers reduces hours of leisure and the opportunities for this public to engage in guided PA[22].

When we analyzed the association between the number of barriers and health indicators, those with a negative perception of health reported more barriers to the practice of PA. In this same direction, Rogerson et al.[23] observed that 78% of patients with coronary artery disease, classified as physically inactive, reported a negative perception of health and also claimed that aspects linked to the disease itself are barriers to being physically active. Therefore, it is suggested that for many patients, it may be difficult to deal with the diagnosis of cardiovascular disease, which may cause fear of developing symptoms associated with a higher cardiovascular risk during the practice of PA. In addition, the literature indicates

that adults with dyslipidemia, hypertension, and diabetes have a worse perception of health and are less likely to adhere to PA recommendations[24].

The relationship between the presence of cardiovascular disease, negative perception of health, greater perception of barriers to PA practice, and a greater chance of being physically inactive is evident. It is suggested that encouraging adherence to the practice of PA in patients with NCDs may result in a better perception of the health status of these patients[25]. However, considering the cross-sectional design of the present study and the other studies cited, the possibility of reverse causality must be considered. In any case, it is worth highlighting the importance of the regular practice of PA regardless of health perception, due to its various health benefits, especially in hypertensive individuals[4–6].

A greater number of self-reported diseases is positively associated with a greater number of perceived barriers in the present study. Corroborating this finding, Gee et al.[26] identified that the most common barrier to PA practice was the challenge of managing a coexisting physical condition with the objective to control blood pressure levels. Turi et al.[27] observed that a sedentary lifestyle is more prevalent in patients who reported both hypertension and type 2 diabetes mellitus (87.2%) than in patients who reported only hypertension (56.9%). In this same direction, Brawner et al.[28] identified that each additional chronic disease was associated with 17% fewer chance of reaching the guidelines of the practice of PA, in comparison to individuals without NCDs. Therefore, it is implied that the greater number of chronic diseases added to the higher prevalence of perceived barriers may be the factors responsible for lower engagement and adherence to the practice of PA in this population.

One of the limitations of our study was the use of a subjective measure to assess PA. In practice, problems were identified regarding questionnaire interpretation by the participants, mainly concerning the identification of frequency, duration, and intensity of the activities, which compromised the classification of individuals as physically active or non-active. Therefore, for future studies, it is suggested that more precise measures of PA be used, such as accelerometers.

One strong point of the present study is the originality of the theme, since few studies have focused on identifying the level of PA in hypertensive patients and associating barriers to the practice of PA with sociodemographic and health aspects in this population. Such knowledge may allow professionals and organizations to identify the strategies and actions that would more efficiently promote PA for this public and the sociodemographic and health characteristics indicating those who need the most attention in this sense.

CONCLUSION

In conclusion, physically non-active, hypertensive patients report a considerable number of barriers to regular PA practice, and the most prevalent barriers are mainly associated with social, economic, and psychological factors, in addition to the disease and its complications. Furthermore, it is concluded that a higher report of barriers is influenced by sex and education level, and also by health perception and number of comorbidities. In this sense, strategies to raise awareness of the benefits of PA and behavioral changes should be proposed, especially among women and patients with low education levels, negative perceptions of health, and a greater presence of associated comorbidities, in an attempt to reduce perceived barriers and, consequently, increase the levels of PA of physically non-active, hypertensive patients.

COMPLIANCE WITH ETHICAL STANDARDS

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Ethical approval

Ethical approval was obtained from the local Human Research Ethics Committee – Federal University of Santa Catarina and the protocol (no. 3.198.368) was written in accordance with the standards set by the Declaration of Helsinki.

Conflict of interest statement

The authors have no conflict of interests to declare.

Author Contributions

Conceived and designed the experiments: KV, AMG. Performed the experiments: KV, JCC, TPV, JAM, ACAC, GPC. Analyzed the data: KV, JCC, GTB, AMG. Contributed reagents/materials/analysis tools: ARF. Wrote the paper: KV, JCC, GTB, TPV, JAM, ACAC, GPC, ARF, AMG.

REFERENCES

1. WHO: World Health Organization [Internet]. Global report on hypertension: the race against a silent killer. Switzerland: WHO; 2014 [cited 2024 Jan 19]. Available from: https://www.who.int/publications/i/item/9789240081062
2. Barroso WKS, Rodrigues CIS, Bortolotto LA, Mota-Gomes MA, Brandão AA, Feitosa A, et al. Diretrizes brasileiras de hipertensão arterial - 2020. Arq Bras Cardiol. 2020;116(3):516-658. http://dx.doi.org/10.36660/abc.20201238. PMid:33909761.
3. Whelton PK, Carey RM, Aronow WS, Casey DE, Collins KJ, Himmelfarb CD, et al. Guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: executive Summary. J Am Coll Cardiol. 2018;71(19):2199-269. http://dx.doi.org/10.1016/j.jacc.2017.11.005. PMid:29146533.
4. Pescatello LS, MacDonald HV, Lamberti L, Johnson BT. Exercise for hypertension: a prescription update integrating existing recommendations with emerging research. Curr Hypertens Rep. 2015;17(11):87. http://dx.doi.org/10.1007/s11906-015-0600-y. PMid:26423529.
5. MacDonald HV, Johnson BT, Huedo-Medina TB, Livingston J, Forsyth KC, Kraemer WJ, et al. Dynamic resistance training as stand-alone antihypertensive lifestyle therapy: a meta-analysis. J Am Heart Assoc. 2016;5(10):e003231. http://dx.doi.org/10.1161/JAHA.116.003231. PMid:27680663.
6. Bunn PS, Lima NS, Venturini GRO, Silva EB. The chronic effects of muscle-resistance training in arterial pressure of hypertensive older adults: a meta-analysis. Fisioter Mov. 2019;32:1-13. http://dx.doi.org/10.1590/1980-5918.032.ao05.
7. Uzun S, Kara B, Yokuşoğlu M, Arslan F, Yilmaz MB, Karaeren H. The assessment of adherence of hypertensive individuals to treatment and lifestyle change recommendations. Anadolu Kardiyol Derg. 2009;9(2):102-9. PMid:19357051.

8. Murta IGP, Agostini DFB, Lucinda F. Avaliação das barreiras à prática de atividade física em pacientes com doenças crônicas não transmissíveis. Rev Med Minas Gerais. 2018;28:12-8.
9. Sallis JF, Owen N. Physical activity and behavior medicine. California: Sage publications; 1999.
10. Guedes MVC, Araujo TL, Lopes MVO, Silva LF, Freitas MCF, Almeida PC. Barreiras ao tratamento da hipertensão arterial. Rev Bras Enferm. 2011;64(6):1038-42. http://dx.doi.org/10.1590/S0034-71672011000600008. PMid:22664601.
11. Pinheiro KC, Silva DAS, Petroski ED. Barreiras percebidas para prática de musculação em adultos desistentes da modalidade. Rev Bras Ativ Fis Saúde. 2010;15(3):157-62.
12. Boscatto EC, Duarte MDFS, Gomes MDA. Estágios de mudança de comportamento e barreiras para a atividade física em obesos mórbidos. Rev Bras Cineantropom Desempenho Hum. 2011;13(5):329-34.
13. Matsudo S, Araujo T, Matsudo V, Andrade D, Andrade E, Oliveira LC, et al. Questionario Internacional de Atividade Física (IPAQ): Estudo de Validade e Reprodutibilidade no Brasil. Rev Bras Ativ Fis Saúde. 2001;6(2):5-18.
14. Adeniyi A, Idowu O, Ogwumike O, Adeniyi C. Comparative influence of self-efficacy, social support and perceived barriers on low physical activity development in patients with type 2 diabetes, hypertension or stroke. Ethiop J Health Sci. 2012;22(2):113-9. PMid:22876075.
15. Satariano WA, Haight TJ, Tager IB. Reasons given by older people for limitation or avoidance of leisure time physical activity. J Am Geriatr Soc. 2000;48(5):505-12. http://dx.doi.org/10.1111/j.1532-5415.2000.tb04996.x. PMid:10811543.
16. Gebrezgi MT, Trepka MJ, Kidane EA. Barriers to and facilitators of hypertension management in Asmara, Eritrea: patients' perspectives. J Health Popul Nutr. 2017;36(1):11. http://dx.doi.org/10.1186/s41043-017-0090-4. PMid:28407794.
17. Batista LC, Assis CS, Wolosker N, Zerati AE, Silva RSG. Association between fatigue and functional capacity in patients with intermittent claudication. Rev Bras Enferm. 2015;68(5):937-44. http://dx.doi.org/10.1590/0034-7167.2015680524i.
18. Rech CR, Camargo EM, Araujo PAB, Loch MR, Reis RS. Perceived barriers to leisure-time physical activity in the brazilian population. Rev Bras Med Esporte. 2018;24(4):303-9. http://dx.doi.org/10.1590/1517-869220182404175052.
19. Silva CRM, Bezerra J, Soares FC, Mota J, Barros MVG, Tassitano RM. Percepção de barreiras e facilitadores dos usuários para participação em programas de promoção da atividade física. Cad Saude Publica. 2020;36(4):1-12. http://dx.doi.org/10.1590/0102-311x00081019.
20. Krug RR, Lopes MA, Mazo GZ. Barriers and facilitators for the practice of physical activity in old and physically inactive women. Rev Bras Med Esporte. 2015;21(1):57-64. http://dx.doi.org/10.1590/1517-86922015210101673.
21. Cavalcante BR, Farah BQ, Barbosa JPA, Cucato GG, Chehuen MR, Santana FS, et al. Are the Barriers for Physical Activity Practice Equal for All Peripheral Artery Disease Patients? Arch Phys Med Rehabil. 2015;96(2):248-52. http://dx.doi.org/10.1016/j.apmr.2014.09.009. PMid:25281872.
22. Boing AF, Subramanian S, Boing AC. Association between area-level education and the co-occurrence of behavior-related risk factors: a multilevel analysis. Rev Bras Epidemiol. 2019;22:e19005. http://dx.doi.org/10.1590/1980-549720190052. PMid:31826108.
23. Rogerson MC, Murphy BM, Bird S, Morris T. "I don't have the heart": a qualitative study of barriers to and facilitators of physical activity for people with coronary heart disease and depressive symptoms. Int J Behav Nutr Phys Act. 2012;9:140. http://dx.doi.org/10.1186/1479-5868-9-140. PMid:23194091.
24. Forechi L, Mill JG, Griep RH, Santos I, Pitanga F, Molina MDCB. Adherence to physical activity in adults with chronic diseases: ELSA-Brasil. Rev Saude Publica. 2018;52:31. http://dx.doi.org/10.11606/S1518-8787.2018052000215. PMid:29641656.

25. Coelho CF, Burini RC. Atividade física para prevenção e tratamento das doenças crônicas não transmissíveis e da incapacidade funcional. Rev Nutr. 2009;22(6):937-46. http://dx.doi.org/10.1590/S1415-52732009000600015.

26. Gee ME, Bienek A, Campbell NRC, Bancej CM, Robitaille C, Kaczorowski J, et al. Prevalence of, and barriers to, preventive lifestyle behaviors in hypertension (from a National Survey of Canadians With Hypertension). Am J Cardiol. 2012;109(4):570-5. http://dx.doi.org/10.1016/j.amjcard.2011.09.051. PMid:22154320.

27. Turi BC, Codogno JS, Fernandes RA, Monteiro H. L. Associação entre doenças crônicas em adultos e redução dos níveis de atividade física. Medicina (Ribeirao Preto Online). 2011;44(4):389-95. http://dx.doi.org/10.11606/issn.2176-7262.v44i4p389-395.

28. Brawner CA, Churilla JR, Keteyian SJ. Prevalence of Physical activity is lower among individuals with chronic disease. Med Sci Sports Exerc. 2016;48(6):1062-7. http://dx.doi.org/10.1249/MSS.0000000000000861. PMid:26741117.