Factors related to leisure-time physical inactivity in obese women

Fatores relacionados à inatividade física no lazer em mulheres obesas

Taise Santos do Nascimento[1]
Fernanda Carneiro Mussi[1]
Cátia Suely Palmeira[1]
Carlos Antônio Teles Santos[2]
Melissa Almeida Santos[1]

Abstract

Objective: To verify the factors related to leisure-time physical inactivity (PI) in overweight women.

Methods: A cross-sectional study, part of a matrix project entitled, "Remote nurse monitoring of overweight women", conducted in an outpatient reference clinic for obesity in Salvador, Bahia, Brazil, in which a multidisciplinary team and 300 patients, 91% women, of the Unified Health System, were selected for the study. A total of 174 women were recruited, according to inclusion criteria for the matrix project: overweight (BMI ≥ 25 kg/m²), more than 18 years of age, attended a medical visit in the last 12 months, and had a landline telephone and/ or cell phone. Exclusion criteria were: lack of physical conditions for anthropometric measures, lack of cognitive ability to respond to research instruments, psychiatric disorders, use of medications for weight loss, and bariatric surgery. The International Physical Activity Questionnaire guidelines for data processing and analysis were followed.

Results: A high prevalence of PI (85.2%) was identified, as well as a significant association between PI and body mass index, self-efficacy for physical activity, environment perception, dependents at home, perceived health status, and number of comorbidities. Regression analysis showed that PI was associated with the number of comorbidities RP:1.31; IC 95% 1.06; 1.64); poor self-perception of health (RP: 1.28, 1.01, 1.61); low self-efficacy (RP: 1.27, 1.06, 1.51); and poor environmental perception (RP: 1.27, 95% CI 1.01, 1.60).

Conclusion: Leisure-time physical inactivity was associated with individual and environmental variables.

Resumo

Objetivo: Verificar os fatores relacionados à inatividade física (IF) no lazer em mulheres com excesso de peso.

Métodos: Estudo transversal, recorte de um projeto matriz denominado "Monitoramento remoto de enfermagem de mulheres com excesso de peso", desenvolvido em ambulatório de referência para obesidade, em Salvador, Bahia, Brasil, no qual uma equipe multidisciplinar cerca de 300 usuários do Sistema Único de Saúde, sendo 91% mulheres, razão pela qual foram selecionadas para o estudo. Mediante consulta aos prontuários 174 mulheres foram recrutadas atendendo aos critérios de inclusão para o projeto matriz: ter excesso de peso (IMC ≥25 Kg/m²), idade superior a 18 anos, comparecido a consulta médica nos últimos doze meses e telefone fixo e/ou celular. Foram critérios de exclusão: ausência de condições físicas para medidas antropométricas e cognitivas para responder aos instrumentos da pesquisa, distúrbios psiquiátricos, uso de drogas para perda de peso e realização de cirurgia bariátrica. Obedeceu-se as orientações do processamento e de análise dos dados do IPAQ.

Resultados: Houve alta prevalência de IF (85,2%) e associação significante entre IF e índice de massa corporal, autoeficácia para atividade física, percepção do ambiente, dependentes no domicílio, estado de saúde percebido e número de comorbidades. Na regressão, a IF associou-se ao número de comorbidades (RP:1,31; IC 95% 1,06;1,64); a autopercepção de saúde ruim (RP: 1,28; 1,01;1,61); a baixa autoeficácia (RP:1,27; 1,06; 1,51) e a percepção do ambiente ruim (RP:1,27; IC 95% 1,01;1,60).

Conclusão: A IF no lazer associou-se a variáveis individuais e ambientais.

Corresponding author
Fernanda Carneiro Mussi.
Dr. Augusto Viana Filho Avenue, SN, 40110-16, *Campus* Canela, Canela, BA, Brazil.
femussi@uol.com.br

Introduction

Non-communicable and chronic diseases, such as obesity, are increasing significantly in developed and developing countries. The prevalence of overweight in the Brazilian adult population, in 2015, was 53.9.5% (57.6% men and 50.8% women). This panorama is associated with the way of life of a modern society, which determines a food pattern that, associated with the sedentary lifestyle, is not favorable to the health of the population.[1]

Excess weight is a risk factor for cardiovascular diseases, endocrine and respiratory disorders, and some types of neoplasms, and is one of the risk factors for illness and death.[2] The increase in the prevalence of overweight is a public health problem, considering the impact of this condition on health and quality of life. Preventing and controlling this risk factor is a challenge, and calls for reflection on the causal factors.

The etiology of obesity is complex and multifactorial, resulting from the interaction between genes, environment, lifestyle, physical activity practices, and dietary pattern.[3] The more active one's lifestyle, the lower the likelihood of that person becoming obese.[4]

Although the benefits of physical activity in promoting and preventing health problems are known, more than two million annual deaths are attributed to PI, due to its repercussion in the increase of non-communicable chronic diseases that, if current trends are maintained, will be related to 73% of the world's deaths by 2020.[2] The last survey of the Brazilian Ministry of Health, in 2015, showed that the prevalence of PI remains high, reaching 47.5% of the population in 2015.[5]

Several researchers have sought to understand how physical activity can be influenced and how to motivate the population. Sociodemographic characteristics, such as sex, age, education, occupation and marital status, appear to be determining factors for a sedentary lifestyle. In addition, other variables, such as self-efficacy and environmental factors, appear to be associated.[6,7]

However, despite the advances in the state of the art on factors involved in PI, gaps in the literature regarding individual and environmental factors that affect women remain, particularly overweight and obesity. Most studies available were conducted in developed countries.[8,9]

Considering the importance of regular physical activity in the collective, and a healthy lifestyle for controlling body weight and prevention of chronic non-communicable diseases, the knowledge about the epidemiological pattern of this practice must be mastered, and sub-groups of individuals monitored. This knowledge can guide health and nursing care practices, as well as public policies to support the practice of physical activity and controlling of body weight through integrated and interrelated actions of health professionals and the community at large.

On the basis of the above, the objective of this study was to verify the factors associated with leisure-time PI in obese women.

Methods

This was a cross-sectional study, which was one portion of a matrix project entitled, "Remote nurse monitoring of overweight women", conducted in a outpatient reference clinic for obesity in Salvador, Bahia, Brazil, in which a multidisciplinary team and about 300 patients of the *Unified Health System*, 91% of whom were women, were selected for the study.

A total of 174 women were recruited, according to the inclusion criteria for the matrix project: overweight (BMI ≥ 25 kg/m²), more than 18 years of age, attended a medical visit in the last twelve months, and who had a landline telephone and/or cell phone. The exclusion criteria were: absence of physical conditions for anthropometric measures, cognitive inability to respond the research instruments, psychiatric disorders, use of medications for weight loss, and bariatric surgery.

Eligible women were consulted by telephone about their interest in participating in the survey, and were invited to the office on a scheduled date. At that occasion, the objectives and procedures of the research were clarified, and the Terms of Free

and Informed Consent Form was signed. After receiving consent, the interview and anthropometric evaluation began in a private room.

Body weight was verified using a digital scale, TEC 30-Techline® model, with a variation of 0.1 kg; stature was measured using a portable stadiometer, according to the procedures specified in the literature.[10] The body mass index was obtained by taking the weight, in kilograms, divided by the square of the height, in meters. The following classification was adopted: overweight (25 to 29.9kg/m²); Class I obesity (30 to 34.9kg/m²); Class II obesity (35 to 39.9kg/m²), and Class III obesity (≥40kg/m²).

Closed questions were used for sociodemographic characteristics, involving: age, self-declared race/skin color, marital status, education, work situation, monthly family income, and number of household dependents.

The International Physical Activity Questionnaire (IPAQ-L) was used to evaluate the physical activity pattern, with questions related to the frequency, duration and intensity of the physical activities performed for more than ten continuous minutes during the past week, including four physical activities (work, commuting, domestic activities, and leisure). Its validity and reliability are described in the literature.[12] The IPAQ guidelines for data processing and analysis were followed.

Health self-perception was assessed by the question: "how do you consider your health today?".[13] The answers were categorized as very good/good, normal, and bad/very bad.

The *Perception of the environment for physical activity practice scale* was used, validated by Florindo et al. (2009), with 38 questions, and scores varying from 0 to 58 points. The higher the score obtained, the better the perception of the environment. The scale assesses different aspects of the physical environment that can favor walking and the practice of physical activity in leisure and movement.[14] The first part contains 18 questions about availability and proximity of leisure structures, services and conveniences in the neighborhood, which are less than a ten-minute walk from home. The second part contains 20 questions related to the availability

and quality of environmental structures (green areas, sidewalks, garbage accumulation) close to the patient's home, perceived safety in traffic and environment, social support, climate, and the presence of pets at home. The validation study on the scale does not suggest cutoff points, but indicates that the higher the score, the better the perception of the environment. Thus, the scores obtained by the quartiles enabled the classification of the environmental perception by individuals as: good (36 to 51 points), satisfactory (31 to 35 points), normal (27 to 30 points), and bad (13-26 points).

The self-efficacy for physical activity practice was evaluated by the Brazilian-validated scale, by Rech et al. (2011), with ten items distributed in two groups, with scores ranging from zero to ten: 1) walks in free time (five items) and 2) participates in moderate and/or vigorous physical activity (five items). The scale scores were computed with the sum of the responses of each group considering the answer "yes" as value one, and "no" as zero. The higher the value obtained, the higher the self-efficacy. Thus, using the quartiles, the scores allowed the classification of self-efficacy as: good (7 to 10 points); normal (5 to 6 points); satisfactory (3 to 4 points); and poor (0 to 2 points).

The research was approved by the Ethics Committee, protocol nº 1,152,259 and met the national and international norms of ethics in research involving human beings.

Data analyzed are presented in absolute and relative frequencies, means and standard deviations. The prevalence ratio was used, with a 95% confidence interval (CI) to analyze the association between the variables of interest and physical inactivity in leisure-time. In the bivariate analysis, the Pearson's Chi-square test was used, and the variables with a value of p≤0.20 was included in the logistic regression model: dependent person at home; body mass index; number of comorbidities; health self-perception; self-efficacy; and perception of the environment. The regression modeling was performed using the backward algorithm. To choose the model, the Akaike in-

formation criterion (AIC) and the lowest values were chosen. The Hosmer-Lemeshow test and the ROC curve area were used to assess the accuracy and quality of fit for the logistic model. Due to the fact that PI was common in the sample, the Robust Poisson Regression Model was applied to correct risks. The STATA Statistical software, version 12, was used.

Results

One hundred and forty-two women met the inclusion criteria and agreed to participate in the study. The mean age was 50.66 years (SD=11.59), minimum age was 21 and maximum was 81 years. Black women (93.7%) and those who were married/in a stable union (55.6%) predominated, with a medium educational level; 66.4% had complete or incomplete high school/higher education. The majority was self-employed at a paid occupation (51.4%), retired but participated in some work activity, or were employed. The prevalent monthly family income was one to three times the minimum wage (39.2%), with a mean of three people living at home (SD= 0.328), and 31.0% had dependents for whom they provided care at home.

The mean BMI was 36.29 kg/m2 (SD=6.23), with a higher proportion of obese women (83.1%), 31.7% had class III obesity, 29.5% had class I, and 21.8% had class II. Of the total, 16.9% were overweight. Most patients had one or more comorbidities, such as hypertension, diabetes mellitus, or arthrosis, and considered their health status to be normal (54.9%).

The analysis of global PI, as evaluated by the IPAQ, considering the domains of work, commuting, domestic activities, and leisure, showed that 65.5% of the women were active/very active, as they achieved the recommendation for participating in physical activity ≥150minutes/week. A lower proportion (34.5%) was irregularly active/sedentary. Regarding the level of PI per IPAQ domain, 54.2% were inactive at home; 64.4% at work; 78.1% when commuting, and 85.2% during leisure. The self-efficacy for participating in physical activity was normal/bad for 53.5% of the participants.

A higher prevalence of leisure-time PI was identified in women who were: aged 40-59 years (87.8%); white skin color/race (88.9%); without a stable union (88.9%); elementary level of education (89.6%); unemployed (88.4%); living with people dependent on care (93.2%); income one to three times the minimum wage (89.3%); obesity class III (95.6%); two associated comorbidities (90.6%); very poor/poor self-perception of health (96.3%); poor self-efficacy for participating in physical activity (97.6%); and who had a normal/satisfactory perception of the environment (89.7%) (Table 1).

In the bivariate analysis, an association of PI in leisure-time was found in those with home care dependents (PR: 1.14, 95% CI 1.01, 1.29), patients with class III obesity (PR: 1.27, 95 % 1.00, 1.62); two associated comorbidities (PR: 1.23, 95% CI 0.98, 1.56); normal health self-perception (PR: 1.33, 95% CI 1.05, 1.68); poor/very poor health self-perception (PR: 1.43, 95% CI 1.13, 1.80); poor self-efficacy (PR: 1.25, 95% CI 1.03, 1.51); and poor/satisfactory perception of the environment (PR: 1.26, 95% CI 0.97, 1.63) (Table 1).

The best logistic model was chosen according to the lowest Akaike information criterion; the accuracy of the model was evaluated by the ROC curve, whose area was 0.88; and the quality of the model obtained by the Hosmer-Lemeshow test was p=0.83. In the multivariate model, women with one and two comorbidities had a respective increase of 27% (PR 1.27; 95% CI:1.02;1.58) and 31% (PR: 1.31, 95% CI:1,06;1.64) in PI during leisure-time. Those with poor (PR: 1.28, 95% CI:1.01;1.61) and normal (PR: 1.25, 95% CI:1.00;1.56) self-perception were 28% and 25% less active, respectively. Women with poor self-efficacy for participating in physical activity were 27% less active (PR: 1.27, 95% CI:1.06;1.51), as well as those with a satisfactory perception of the environment (PR : 1.27, 95% CI: 1.01;1.60). Although there was no statistically significant association between PI and environmental perception, it was noticed that women with a worse perception presented as being prone to increasing their PI during leisure-time. Similarly,

this likelihood for increase was noted in those with home care of dependents, and obesity class I and III (Table 2).

Table 1. Prevalence and prevalence ratio of inactivity in leisure-time according to sociodemographic and clinical characteristics, self-perception of health, and perception of the environment of overweight women

Sociodemographic characteristics	n(%)	Prevalence (%)	p-value	PR	95% CI
Age			0.520		
18 -39 years old	25(17.6)	80.0			
≥40 to 59 years old	90(63.4)	87.8		1.10	(0.89; 1.36)
≥60 years old	27(19.0)	81.8		1.02	(0.78; 1.33)
Race/Skin color			0.748		
White	9(6.3)	88.9			
Mixed color (brown and black)	133(93.7)	85.0		0.96	(0.75; 1.22)
Marital status			0.270		
Without partner	63(44.4)	88.9			
With partner	79(55.6)	82.3		0.93	(0.81; 1.06)
Education			0.294		
Up to elementary education	48(33.8)	89.6			
High school/incomplete or complete Higher education	94(66.2)	83.0		0.57	(0.19; 1.65)
Occupation			0.297		
Unemployed	69(48.6)	88.4			
Employed	73(51.4)	82.2		0.93	(0.81; 1.07)
Home care dependents			0.073*		
No	98(69.0)	81.6			
Yes	44(31.0)	93.2		1.14	(1.01; 1.29)
Family monthly income			0.310		
≥ 3 MW	36(25.4)	77.8			
> 1 to <3 MW12	56(39.4)	89.3		1.15	(0.94; 1.40)
≤ 1 MW (2)	50(35.2)	86.0		1.11	(0.90; 1.36)
BMI			0.063*		
Overweight	24(16.9)	75.0			
Class I obesity	42(29.6)	85.7		1.14	(0.88; 1.48)
Class II obesity	31(21.8)	77.4		1.03	(0.77; 1.40)
Class III obesity	45(31.7)	95.6		1.27	(1.00; 1.62)
Number of comorbidities			0.200*		
None (0)	30(21.1)	73.3			
One (1)	45(31.7)	86.7		1.18	(0.92; 1.51)
Two (2)	53(37.3)	90.6		1.23	(0.98; 1.56)
Three (3)	14(9.9)	85.7		1.17	(0.86; 1.59)
Health self perception*			0.001*		
Good/ very good	37(26.1)	67.6			
Normal	78(54.9)	89.7		1.33	(1.05; 1.68)
Very poor/poor (2)	27(19.0)	96.3		1.43	(1.13; 1.80)
Self-efficacy for physical activity (n=140)			0.059*		
Good	32(22.9)	78.1			
Satisfactory	33(23.6)	78.8		1.00	(0.78; 1.30)
Normal	34(24.2)	82.3		1.05	(0.83; 1.34)
Bad	41(29.3)	97.6		1.25	(1.03; 1.51)
Perception of the environment (n=140)			0.143*		
Good	28(20.0)	71.4			
Satisfactory	39(27.9)	89.7		1.26	(0.97;1.63)
Normal	34(24.2)	85.3		1.19	(0.91;1.57)
Bad	39(27.9)	89.7		1.26	(0.97;1.63)

* Pearson Chi-square test p-value; † Fisher's exact test p-value; MW - Minimum Wage; PR - Prevalence ratio; CI - Confidence interval; * Standardized by Z Score

Table 2. Factors related to physical inactivity during leisure-time in overweight women

Variables	PR	CI(95%)
Home care dependents		
No	1	1.00
Yes	1.14	(0.99; 1.32)
BMI		
Overweight	1	1.00
Class I obesity	1.14	(0.90; 1.46)
Class II obesity	0.95	(0.73; 1.23)
Class III obesity	1.21	(0.97; 1.51)
Number of comorbidities*		
None	1	1.00
One	1.27	(1.02; 1.58)
Two	1.31	(1.06; 1.64)
Three	1.29	(0.98; 1.70)
Health self-perception*		
Good	1	1.00
Normal	1.25	(1.00; 1.56)
Poor	1.28	(1.01; 1.61)
Self-efficacy (n=140)		
Good	1	
Satisfactory	1.09	(0.86; 1.37)
Normal	1.15	(0.92; 1.43)
Bad	1.27	(1.06; 1.51)
Perception of the environment *(n=140)		
Good	1	1.00
Satisfactory	1.27	(1.01; 1.60)
Normal	1.15	(0.90; 1.46)
Bad	1.21	(0.96; 1.53)
AIC = 299,0284		

Logistic regression model - p-value <0.05; RP - Prevalence ratio

Discussion

Physical activity during leisure-time is one of the dimensions of physical activity which is recommended worldwide;[15] however, in this study, the prevalence of PI was high, and it was in fact higher than that of other investigations.[16-18]

The socio-demographic profile of the sample was corroborated with other studies, with a higher proportion of PI in those who were: aged 40-59 years,[19] educated at a lower level,[20] married,[21] and had home care dependents.[21] Physical inactivity in leisure-time is also associated with family income, because, women with lower incomes tend to have less knowledge about healthy habits, time to spend on healthy levels of physical activity, and opportunities for recreational activities, which is one of the main barriers to participation in physical activity in developing countries.[22]

The prevalence of PI was higher in women with home care dependents (children and/or sick people), relating to the historical roles played by women as wives, mothers and caregivers, corroborating the findings of another study in which the presence of a great number of children at home made it difficult to participate in physical activity during leisure-time, when they had no one to take care of their children.[21] Other research showed that family obligations and family income were associated with PI during leisure-time within the population (45.4%) and, for women, these obligations were statistically significant.[23]

Another relevant fact was that the higher the body mass index, the greater the prevalence of PI in leisure-time, demonstrating that excess of weight is a factor negatively associated with participation in physical activity, as previously evidenced.[24]

Health self-perception, although rarely used in the clinic, has a strong association with mortality, morbidity and quality of life,[13,19,25] and was a predictor for inactive behavior during leisure-time in this study. Thus, nurses need to know the health self-perception of overweight women in their daily care, as well as illness and self-care, and be able to establish and propose health care actions guided by their characteristics and needs.[13] The nurse can identify with the women in how they can help them to improve their health condition, and support them with shared care actions.

This study showed self-efficacy was predictive of PI, that is, the belief of the individual's success in the result of physical activity is fundamental to her practice. Meurer et al. (2015), identified that elderly individual participants of physical activity programs presented greater self-efficacy for walking compared to non-participants, emphasizing the importance of self-efficacy in planning and systematizing actions to increase physical activity.[26] Thus, increasing the levels of self-efficacy may be an important component in health promotion strategies.[6,27] Activities in which women express their beliefs can provide a better understanding of the actual perspectives for results. In addition, visualizing other people adopting the behavior can increase the belief in the accomplishment of the activity. Techniques involving group discussion, private conversations, telephone conversations, e-mail messages, and reading behavioral texts may be strategies used by nurses to increase the women's confidence in their ability to perform and maintain the behavior.[27]

The lowest perception of the environment was also associated with PI during leisure-time. In the American study conducted with 3,434 women, those living in areas with greater number of facilities and shopping centers were more likely to meet walking recommendations, and those living near food places were almost twice as likely to be overweight (OR=1.77, 95% CI: 1.33; 2.20).[28] Similar data were found in the study that identified that people who participated in physical activity during leisure-time had greater means in the scores of facilities/conveniences, perception of general safety, and social support for participating in physical activity.[29] In this sense, variables related to environment can improve the understanding of individual behaviors and barriers to maintaining inactive behavior. Public policies and actions should focus on improving environmental conditions to enhance participation in physical activity.

Given these findings, it is a challenge for the multidisciplinary health team to stimulate the acquisition and maintenance of regular participation in physical activity during leisure-time, beginning at the youngest ages. Multiprofessional teams in the follow-up of overweight women should develop health education programs that stimulate recovery and clarify the recommendations for participation in physical activity. The stimulation for participation in physical activity can be provided by different integrated actions of nurses and physical educators, along with overweight women, even using the public space as a way to stimulate healthier living habits in an interactive and fun way. In addition, the provision of public spaces for participation in physical activities during leisure-time, individually or in groups, is a fundamental governmental strategy for health improvement, especially for the less favored subgroups.

The results support the development of intervention programs that emphasize individual and environmental characteristics for a good level of physical activity.

One of the limitations refers to a cross-sectional study, that does not allow for inferring the causality of the results (reverse causality), as the exposure and outcome are collected simultaneously.

Conclusion

A high prevalence of PI during leisure-time was identified. The multivariate model showed that PI was significantly associated with: the number of comorbidities; poor self-perception of health; low self-efficacy; and the perception of a bad environment.

Collaborations

Nascimento TS, Mussi FC and Palmeira CS contributed to the study design, analysis and data interpretation, article writing, adaptation to the norms of the journal, and final approval of the version to be published. Santos CAT contributed to the analytical planning, analysis and data interpretation, and final approval of the version to be published. Santos MA contributed to the data collection, data treatment, and final approval of the version to be published.

References

1. Brasil. Ministério da Saúde. VIGITEL BRASIL 2015: vigilância de fatores de risco e proteção para doenças crônicas por inquérito telefônico [Internet]. Brasília (DF): Ministério da Saúde; 2016. [citado 2017 Jul 4]. Disponível em: http://portalsaude.saude.gov.br/images/pdf/2016/outubro/16/vigitel_brasil_2015.pdf.

2. World Healht Organization (WHO). Global status report on noncommunicable diseases. Geneva: WHO; 2010.

3. Knuth AG, Malta DC, Dumith SC, Pereira CA, Morais Neto OL, Temporão JG, et al. Prática de atividade física e sedentarismo em brasileiros: resultados da Pesquisa Nacional por Amostra de Domicílios (PNAD) 2008. Cien Saúde Colet. 2011; 16(9):3697-705.

4. Barbieri AF, Mello RA. As causas da obesidade: uma análise sob a perspectiva materialista histórica. Conex Rev Fac Educ Física da UNICAMP. 2012; 10(1):133-53.

5. Brasil. Ministério da Saúde. VIGITEL BRASIL 2014. vigilância de fatores de risco e proteção para doenças crônicas por inquérito telefônico. Brasília (DF): Ministério da Saúde; 2014. [citado 2017 Jul 4]. Disponível em: bvsms.saude.gov.br/bvs/publicacoes/vigitel_brasil_2014.pdf.

6. Barros MB, Iaochite RT. Autoeficácia para a prática de atividade física por indivíduos adultos. Motricidade. 2012; 8(2):32-41.

7. Velásquez-Meléndez G, Mendes LL, Maria C, Padez P. Ambiente construído e ambiente social : associações com o excesso de peso em adultos. Cad Saúde Publica. 2012; 29(10):1988-96.

8. Mansfield ED, Ducharme N, Koski KG. Individual, social and environmental factors influencing physical activity levels and behaviours of multiethnic socio-economically disadvantaged urban mothers in Canada: A mixed methods approach. Int J Behav Nutr Phys Act. 2012; 9(1):42.

9. Rhodes RE, Mark RS, Temmel CP. Adult sedentary behavior: A systematic review. Am J Prev Med. 2012; 42(3):e3-28.

10. Brasil. Ministério de Planejamento Orçamento e Gestão. Pesquisa Nacional de Saúde 2013. Manual de antropometria. Rio de Janeiro; 2013.[citado 2017 Jul 4]. Disponível em: http://www.pns.icict.fiocruz.br/arquivos/Portaria.pdf.

11. World Healht Organization (WHO). Process for a global strategy on diet, physical activity and health. [Internet]. Geneva: WHO; 2003. [cited 2017 Jul 4]. Available from: http://apps.who.int/iris/bitstream/10665/67433/1/WHO_NMH_EXR.02.2_Rev.1.pdf.

12. Pardini R, Matsudo S, Matsudo V, Andrade E, Braggion G, Andrade D. Validação do questionário internacional de nível de atividade física (IPAQ - versão 6): estudo piloto em adultos jovens brasileiros. Rev Bras Ciênc Mov. 2001; 9(3):45-51.

13. Arruda GO, Santos AL, Teston EF, Cecilio HP, Radovanovic CA, Marcon SS. Associação entre autopercepção de saúde e características sociodemográficas com doenças cardiovasculares em indivíduos adultos. Rev Esc Enferm USP. 2015; 49(1):60-7.

14. Florindo AA, Péricles E, Ii S, Siqueira R, Iv R. Percepção do ambiente e prática de atividade física em adultos residentes em região de baixo nível socioeconômico. Rev Saúde Pública. 2011; 45(2):302-10.

15. World Health Orgonization (WHO). Global action plan for the prevention and control of noncommunicable diseases 2013-2020. Geneva: WHO; 2013.

16. Del Duca GF, Nahas MV, Garcia LMT, Mota J, Hallal PC, Peres MA. Prevalence and sociodemographic correlates of all domains of physical activity in Brazilian adults. Prev Med (Baltim) 2013; 56(2):99-102.

17. World Health Organization (WHO). Global recommendations on physical activity for health. Geneva: WHO; 2010.

18. Jonck VT, Soares A, Araújo CC, Machado Z, Reis NM, Guimarães AC de A. Prevalencia de atividade física em mulheres. Rev Bras Promoção Saúde. 2014; 27(4):533-40.

19. Suzuki CS, Moraes SA, Freitas IC. Atividade física e fatores associados em adultos residentes em Ribeirão Preto, SP. Rev Saúde Publica. 2011; 45(2):311-20.

20. Pitanga Godim F, Beck CC, Penas Seara Pitanga C, Mota Freitas M, Bastos Almeida LA. Prevalência e fatores sociodemograficos e ambientais associados atividade física no tempo livre e no deslocamento em adultos. Motricidade. 2014; 10(1):3-13.

21. De Sá-Silva SP, Yokoo EM, Salles-Costa R. Fatores demográficos e hábitos de vida relacionados com a inatividade física de lazer entre gêneros. Rev Nutr. 2013; 26(6):633-45.

22. Ward J, Friche AA, Caiaffa WT, Proietti FA, Xavier CC, Roux AV. Association of socioeconomic factors with body mass index, obesity, physical activity, and dietary factors in Belo Horizonte, Minas Gerais State, Brazil: The BH Health Study. Cad Saude Publica. 2015; 31:182-94.

23. Silva SG, Silva MC, Nahas MV, Viana SL. Fatores associados à inatividade física no lazer e principais barreiras na percepção de trabalhadores da indústria do Sul do Brasil. Cad Saúde Publica. 2011; 27(2):249-59.

24. Tucker JM, Tucker LA, Lecheminant J, Bailey B. Obesity increases risk of declining physical activity over time in women: A prospective cohort study. Obesity. 2013; 21(12):715-20.

25. Poubel PB, Lamar E, Araújo FC, Leite GG, Freitas S, Moisés R, et al. Autopercepção de saúde e aspectos clínico-funcionais dos idosos atendidos em uma unidade básica de saúde no norte do Brasil. J Health Biol Sci. 2017; 5(979):71-8.

26. Meurer S, Borges L, Graup S, Benedetti T. Autoeficácia de Idosos iniciantes em um Programa de Exercícios Físicos: comparação entre Permanecentes e Não Permanecentes. Rev Bras Ativ Física Saúde. 2015; 20(1):57-64.

27. Souza CA, Rech CR, Sarabia TT, Añez CRR, Reis RS. Autoeficácia e atividade física em adolescentes de Curitiba, Paraná, Brasil. Cad Saúde Publica. 2013; 29(10):2039-48.

28. Prince SA, Kristjansson EA, Russell K, Billette J, Sawada M, Ali A, et al. A multilevel analysis of neighbourhood built and social environments and adult self-reported physical activity and body mass index in Ottawa, Canada. Int J Environ Res Public Health. 2011; 7600:3953-78.

29. Florindo AA, Guimarães VV, de Farias Júnior JC, Salvador EP, de Sá TH, Reis RS, et al. Validação de uma escala de percepção do ambiente para a prática de atividade física em adultos de uma região de baixo nível socioeconômico. Rev Bras Cineantrop Desemp Hum. 2012; 14(6):647-59.