



FACTORS ASSOCIATED WITH LEISURE-TIME PHYSICAL ACTIVITY AMONG ELDERLY IN SÃO PAULO

Fatores associados à atividade física de lazer entre idosos do município de São Paulo

Factores asociados con la actividad física en el ocio entre personas mayores del municipio de São Paulo

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ABSTRACT

Objective: Analyze the prevalence of Leisure-time Physical Activity in the Sufficient Leisure Domain (LTPA /PASL) among elderly people living in the city of São Paulo and its association with sociodemographic characteristics, health behaviors, and morbidity. **Methods:** This is a cross-sectional study with a sample of 693 elderly people (≥ 60 years old), living in the city of São Paulo, Brazil, whose sociodemographic data, health behavior and morbidity were extracted from the system Surveillance of Risk and Protective Factors for Chronic Diseases through Telephone Survey, referring to the year 2017. Descriptive statistics, association tests by chi-square, simple crude and adjusted logistic regression, by age, gender, and education, as well as multiple regressions were performed. **Results:** Prevalence of PASL among the elderly interviewed was 22.5% ($n=156$). Among the elderly with education >12 years, there was a greater chance of being active ($OR=2.47$; 95% CI 1.58-3.85) in relation to those with 0-8 years of study, as well as among those who presented a “good” health condition ($OR=2.96$; 95% CI 1.12-7.76) and “very good” ($OR=5.14$; 95% CI 1.86-14.23) in relation to those who reported having “Bad/very bad health/don’t know”. **Conclusion:** In the general context, it can be inferred that one in four elderly people living in the city of São Paulo practices enough physical activity during leisure. Among the elderly, the prevalence was higher among the younger ones, male, with a partner, white, higher education, with an occupation, which reported “very good” health condition, reported not having chronic diseases, consuming alcohol, and not being smoker.

Descriptors: Health of the Elderly; Aging; Health Promotion; Cross-Sectional Studies.

RESUMO

Objetivo: Analisar a prevalência de atividade física de lazer em nível suficiente (AFLS) entre idosos residentes no município de São Paulo e sua associação com características sociodemográficas, comportamentos de saúde e morbidade. **Métodos:** Trata-se de um estudo transversal com uma amostra de 693 idosos (≥ 60 anos de idade) residentes no município de São Paulo, Brasil, cujos dados sociodemográficos, comportamento em saúde e morbidade foram extraídos a partir do sistema Vigilância de Fatores de Risco e Proteção para Doenças Crônicas por Inquérito Telefônico, referente ao ano de 2017. Realizou-se estatística descritiva, testes de associação pelo qui-quadrado, regressão logística simples bruta e ajustada, por idade, sexo e escolaridade, assim como regressão múltipla. **Resultados:** A prevalência de AFLS entre os idosos entrevistados foi de 22,5% ($n=156$). Entre os idosos com escolaridade >12 anos houve maior chance de ser ativo ($OR=2,47$; IC95% 1,58-3,85) em relação àqueles com 0-8 anos de estudo, bem como entre os que apresentaram estado de saúde “bom” ($OR=2,96$; IC95% 1,12-7,76) e “muito bom” ($OR=5,14$; IC95% 1,86-14,23) em relação àqueles que relataram possuir saúde “ruim/muito ruim/não sabe”. **Conclusão:** No contexto geral, pode-se inferir que um a cada quatro idosos moradores do município de São Paulo praticam atividade física suficiente no lazer. Entre os idosos, a prevalência foi maior entre os mais jovens, do sexo masculino, com companheiro, branco, maior escolaridade, com ocupação, que relataram estado de saúde “muito bom”, referiram não possuir doenças crônicas, consumir bebida alcoólica e ser não fumante.

Descritores: Saúde do Idoso; Envelhecimento; Promoção da Saúde; Estudos Transversais.



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RESUMEN

Objetivo: Analizar la prevalencia de actividad física en el ocio en nivel suficiente (AFOS) entre mayores del municipio de São Paulo y su asociación con las características sociodemográficas, las conductas de salud y la morbilidad. **Métodos:** Se trata de un estudio transversal con la muestra de 693 mayores (≥ 60 años de edad) del municipio de São Paulo, Brasil, cuyos datos sociodemográficos, las conductas de salud y la morbilidad fueron sacados del sistema de Vigilancia de Factores de Riesgo y Protección para Enfermedades Crónicas por Encuesta Telefónica referente al año 2017. Se realizó la estadística descriptiva, las pruebas de asociación por el chi-cuadrado, la regresión logística simple bruta y ajustada para la edad, el sexo y la escolaridad así como la regresión múltiple. **Resultados:** La prevalencia de la AFOS entre los mayores entrevistados ha sido del 22,5% ($n=156$). Entre los mayores con más de 12 años de escolaridad hubo más oportunidad de ser activo ($OR=2,47$; $IC95\% 1,58-3,85$) que aquellos con hasta 8 años de estudio así como entre los que presentaron el estado de salud “bueno” ($OR=2,96$; $IC95\% 1,12-7,76$) y “muy bueno” ($OR=5,14$; $IC95\% 1,86-14,23$) que aquellos que relataron tener “mala/muy mala” salud o “no sabe”. **Conclusión:** En el contexto general se puede decir que uno de cada cuatro mayores del municipio de São Paulo practica actividad física suficiente en el ocio. Entre los mayores, la prevalencia ha sido mayor entre los más jóvenes, del sexo masculino, con pareja, de color blanco, con más escolaridad y con ocupación que han relatado el estado de salud “muy bueno”, no tener enfermedades crónicas, no tomar bebida alcohólica y no ser fumador.

Descriptor: Salud del Anciano; Envejecimiento; Promoción de la Salud; Estudios Transversales.

INTRODUCTION

In recent decades, population aging has been observed in Brazil and worldwide. In 2017, it was estimated that there were 962 million (13%) people aged 60 or over⁽¹⁾. The aging process began more than a century ago in developed nations and advances in the scenario of developing countries, so that, in Europe, 25% of the population is made up of elderly people, already in Latin America, in countries like Venezuela and Peru, the proportion is 10%; in Chile, 16%; in Brazil, 13% and, in Uruguay, 20%⁽¹⁾. One of the justifications for this demographic growth is, mainly, the reduction of mortality and birth rates, with a consequent increase in life expectancy⁽¹⁾.

Within the scenario described above, the concern and the need to expand and improve health care for the elderly population are notorious, taking into account the multifaceted and complex changes that occur with age, which lead to a decrease and / or alteration of muscle composition, bone mass⁽²⁾ and cardiorespiratory capacity⁽³⁾, compromising the performance of several tasks. In addition, the elderly need pharmacological treatments for living with several chronic pathologies and physical, cognitive and mental disabilities, weaknesses which lead to impaired quality of life.

The expansion of chronic diseases in most countries, related to the unhealthy lifestyle of modern life (characterized by tobacco and alcohol consumption, physical inactivity, unhealthy eating and obesity), guided the formulation of preventive strategies in order to face chronic non-communicable diseases (NCDs)^(5,6). Even so, in 2017, death among individuals of all ages due to NCDs in the world represented 73%, that is, more than half of all deaths (28.8 million) are attributable to four risk characteristics: high blood pressure, smoking, high blood glucose and high body mass index⁽⁶⁾.

In order to minimize premature physical disability, prevent or treat NCDs in the aging process, the protective effect of physical activity stands out, which, when practiced regularly, can improve cardiovascular functions^(7,8), physical function⁽⁹⁾, decrease pain⁽¹⁰⁾ and symptoms of anxiety and depression^(11,12), contributing to the development and / or maintenance of functional skills for healthy aging⁽¹³⁾.

Despite the benefits pointed out in relation to the regular practice of physical activity and physiological aging depend on the lifestyle that the person has assumed since childhood, it is estimated that 27.5% of adult individuals in the world do not reach the recommendation to perform at least 150 minutes per week of moderate intensity physical activity or equivalent (≥ 75 minutes per week with an intense or vigorous level, or even a combination of the two intensities)⁽¹⁴⁾, contributing to 1.26 million deaths in 2017⁽¹⁵⁾.

In Brazil, there is an annual increase of individuals active in leisure, rising from 44%, in 2006, to 53.6%, in 2016 (average of 0.97pp / year)⁽¹⁶⁾. On that occasion, physical activity among the elderly went from 31.8%, in 2006, to 40.5%, in 2016 (average of 0.56 pp / year), but causing the lowest growth among all age groups⁽¹⁶⁾.

Despite this, few population-based studies have investigated the prevalence of SLTPA among the elderly Brazilian population⁽¹⁶⁻¹⁸⁾, more specifically in regions of São Paulo⁽¹⁹⁻²²⁾, highlighting the need for national exploration. Thus, the present study aims to analyze the prevalence of sufficient leisure-time physical activity among elderly people living in the city of São Paulo and its association with sociodemographic characteristics, health behavior and morbidity.

METHODS

This is a cross-sectional study, carried out between February and July 2019, whose data were obtained from the Risk and Protection Factors Surveillance System for Chronic Diseases by Telephone Survey (Vigitel), collected between January and December 2017. The Vigitel interview has a system in which the questions are read on the computer screen and their respective answers recorded directly on electronic media, allowing automatic skips of invalid questions resulting from previous answers and minimizing typing errors⁽²³⁾.

The sampling procedure employed by Vigitel aims to obtain a probabilistic sample of the population aged 18 or over; registered in at least one residential landline in the Brazilian territory; obtained in two stages: a) systematic drawing of 5,000 telephone lines in each city, followed by resorting and organization of 25 subsamples of 200 lines, b) drawing of an adult resident of the household to answer the interview^(23,24). These stratifications seek to match the sample's sociodemographic distributions based on projections of the distribution in the 2000 and 2010 Demographic Censuses and their average variation in the inter-census period. The system has its own methods, which can be found in the publication of Vigitel⁽²⁴⁾.

In 2017, Vigitel interviewed 2,052 adults in the city of São Paulo, 766 men and 1,286 women. Of this total, 693 individuals, aged ≥ 60 years (223 men and 470 women) were eligible for this study. The State Data Analysis System (Seade)⁽²⁵⁾ estimated, in the year considered, that 14.3% (1,676,101) were composed of people aged ≥ 60 years in the city of São Paulo.

The outcome variable obtained from leisure-time physical activity (LTPA) has the following categorical classification: sufficient leisure-time physical activity (SLTPA) - individual who practiced ≥ 150 or ≥ 75 minutes a week of moderate or vigorous physical activity, and insufficient leisure physical activity (ILTP) - the individual who did not reach the time in minutes, according to the criteria adopted by Vigitel for the year 2010⁽²⁴⁾. This variable is estimated through five questions: "In the past three months, did you practice any type of physical exercise or sport?", "What is the main type of physical exercise or sport that you practiced?", "Do you practice the exercise at least once a week?", "How many days a week do you usually practice physical exercise or sport?" and "On the day that you practice exercise or sport, how long does this activity last?".

Regarding the exposure variables, it was decided to investigate the demographic and socioeconomic characteristics related to the age group (60-69, 70-79 and ≥ 80 years), sex (male and female), marital relationship (with partner, without partner and no answer/know), race/color (white and non-white), education in years (0-8, 9-11 and ≥ 12), occupation (yes - works and no - no work).

To assess the health status, we chose to select the self-assessment variables of the health status ("very good", "good", "regular", "bad / very bad /no know /no want to inform") and exposure to modifiable risk factors: alcohol consumption and smoking (yes or no) and diagnosis of CNCD: hypertension and diabetes (yes or no).

For statistical analysis, the distribution of the absolute and relative frequency of all variables was performed, and then, according to SLTPA, the chi-square test was used to analyze the association between exposure variables and SLTPA. The variables that presented a significance level of $p < 0.20$ in the chi-square were inserted in the logistic regression analysis to estimate the odds ratio (OR) and the respective 95% confidence intervals (95% CI) and then, adjusting them according to age, sex and education to control the influence of these variables on the estimates. Variables with $p < 0.20$ were selected in the adjusted model for multiple logistic regression analysis, with variables with a significance level lower than 5%. All analyzes received statistical treatment using the Statistical Package for the Social Sciences (SPSS), version 20.0.

Since these are telephone interviews, free and informed consent was replaced by verbal consent obtained during telephone contacts with the interviewees, obtained by the Ministry of Health at the time of the interview. The Vigitel implementation project was approved by the Ministry of Health's National Research Ethics Committee for Human Beings (Opinion No. 355,590, 6/26/2013).

The database is public, does not allow the identification of interviewees and is available from: http://svs.aims.gov.br/bases_vigitel_viva/vigitel.php.

RESULTS

The final sample of the study was composed of 693 elderly people, with an average age of 70.9 years (± 8.0), ranging between 60 and 95 years. Table I presents the description of the variables analyzed, that is, age group, sex, marital relationship, race/color, education (years) and occupation. The results indicate a prevalence of individuals with a younger age group (48.3%; $n = 335$), female (67.8%; $n = 470$), without a partner (56.4%; $n = 391$) and white

(65.2%; n = 452). Regarding education and occupation, 60.9% (n = 422) of the interviewees have between 0-8 years of study and 69.3% (n = 480) have no occupation.

In general, 22.5% (n = 156) of the interviewees declared to practice SLTPA (Table I). It is observed that the elderly population of 60-69 years (25.4%; n = 85) and men (22.9%; n = 51) have a higher proportion of active leisure activities, in relation to the older population, with age ≥ 80 years (16.3%; n = 20), and women (22.3%; n = 105). In the variables marital status, race/color, education (years) and occupation, there is a prevalence of SLTPA in participants with a partner (26%; n = 83), white (25%; n = 113), education equal and/or higher than 12 years (38.1%; n = 553) and with occupation (26.3%; n = 56). The chi-square analysis showed an association of LTPA with the variables age group, marital relationship, race/color, education (years) and occupation ($p < 0.20$).

Table I - Total prevalence among the elderly (+ 60 years) who practice leisure-time physical activity according to sociodemographic characteristics. São Paulo, Vigitel-2017, n = 693.

Variables and categories	Total		SLTPA		p*
	n	%	n	%	
Age group					0.110
60-95	663	100	156	22.5	
60-69	335	48.3	85	25.4	
70-79	235	33.9	51	21.7	
≥ 80	123	17.7	20	16.3	
Sex					0.876
Female	470	67.8	105	22.3	
Male	223	32.2	51	22.9	
Marital relationship					0.184
Without partner	391	56.4	70	19.3	
With partner	291	42	83	26	
No answer	11	1.6	-	-	
Race/color					0.099
White	452	65.2	113	25	
No white	162	23.4	29	17.9	
No answer	79	11.4	14	17.7	
Education (years)					<0.001
0-8	422	60.9	70	16.6	
9-11	132	19.0	33	25	
≥ 12	139	20.1	553	38.1	
Occupation					0.112
No	480	69.3	100	20.8	
Yes	213	30.7	56	26.3	

AFLS = sufficient leisure physical activity; * Independence test (chi-square) that refers to the association of the exposure variable with the outcome

Table II shows a prevalence of 43.7% (n = 303) among the elderly who reported good health status. Among those who reported chronic diseases, having high blood pressure (54%; n = 374) and having diabetes (78.5%; n = 544) were prevalent in the study. The modifiable risk factors related to habits showed a higher prevalence among the elderly who declared not to consume alcohol and not to be a smoker, with 76.2% (n = 528) and 90% (n = 624), respectively. Among the respondents who reported being active at leisure, it is possible to notice a prevalence between the perception of the "very good" health status (41.4%; n = 41), not having high blood pressure (27.3%; n = 87) nor diabetes (24.4%; n = 133), not having the habit of drinking alcohol (29.7%; n = 49) and not being a smoker (23.2%; n = 145). In addition, it is observed that all variables were associated with LTPA, Table II.

Table II - Total prevalence among the elderly (over 60 years old) who practice leisure-time physical activity according to health behaviors and morbidities. São Paulo, Vigitel-2017, n = 693.

Variables and categories	Total		SLTPA		p*
	n	%	n	%	
Health Status					<0.001
Bad/very bad/do not know	50	7,2	5	10	
Regular	241	34.8	30	12.4	
Good	303	43.7	80	26.4	
Very good	99	14.3	41	41.4	
High blood pressure					0.005
No	319	46	87	27.3	
Yes	374	54	69	18.4	
Diabetes					0.019
No	544	78.5	133	24.4	
Yes	149	21.5	23	15.4	
Alcohol consumption					0.036
No	528	76.2	108	20.3	
Yes	165	23.8	49	29.7	
Smoking					0.168
No	624	90	145	23.2	
Yes	69	10	11	16	

AFLS = sufficient leisure physical activity; * Independence test (chi-square) that refers to the association of the exposure variable with the outcome

The result of the crude binary logistic regression indicates an association between SLTPA and the following variables: age group, marital status, race / color, education (years), occupation, health status, high blood pressure, diabetes, alcohol consumption and smoking. However, after adjusting for sex, education (years) and age group, only the variables education (years), health status, high blood pressure and diabetes ($p < 0.20$) remained in the model, Table III.

Table IV presents the results of the multivariate analysis. There was a statistically significant association of SLTPA with education (years) and health status ($p \leq 0.05$). Using the odds ratio (OR) as an association measure, an age of 2.47 times (95% CI 1.58-3.85) was higher among the elderly with an education level ≥ 12 years when compared to those who had 0-8 years of education. In addition, having as reference for comparison having a state of health "bad / very bad / don't know", a 2.96 times greater chance (95% CI 1.12-7.76) was observed among those who reported health status "good" and 5.14 times (95% CI 1.86-14.23) higher among those who reported "very good".

DISCUSSION

The present study pointed out that having a ≥ 12 year education and reporting "very good" and "good" health status are associated with the practice of SLTPA among elderly people living in the city of São Paulo in the sample in question, which reinforces the hypothesis of causality. The results found through Vigitel's twelfth year of monitoring demonstrate interesting reflections on sociodemographic variables, morbidities and habits, as well as deepening them, in addition to contributing to the accumulation of knowledge in the behavior of the aging population.

It is worth remembering that, in general, there has been an increase in the levels of leisure-time physical activity in the world⁽²⁶⁾ and in the Brazilian population^(16,27). However, it is known that, with the aging process, the increase in the levels of leisure physical activity is lower when compared to adults over the years⁽¹⁶⁾, reaching a decrease among the elderly population. In the present study, the results showed that less than a quarter (22.5%) of the sample population is active in leisure.

Studies in the São Paulo region involving the elderly population showed greater variation (28.4%⁽²²⁾ and 25.3%⁽¹⁷⁾) and smaller (21.3%⁽¹⁹⁾, 22.2%⁽²¹⁾ and 15.2%⁽²⁰⁾). In Florianópolis, Santa Catarina, the proportion of elderly people active in leisure was 25.7%⁽²⁸⁾; in Maceio, Alagoas, 23.8%⁽²⁹⁾, and 33% in 15 European countries⁽³⁰⁾. Therefore, the prevalence observed in the current survey was similar to the national average between the years 2009 to 2016⁽¹³⁾.

It is known that the practice of leisure-time physical activity must be performed by any individual⁽³¹⁾ and, in particular, by the elderly population^(7,8,31-33). The gerontological literature emphasizes that the age group of 60 to 79 years old⁽¹⁶⁾ and male⁽¹⁷⁾ has a positive relationship for SLTPA⁽¹⁶⁾. In the present study, it was observed that, after statistical adjustment, it was not possible to establish the difference between age groups and sex.

Table III - Simple logistic regression analysis of the elderly (+ 60 years) who practice leisure-time physical activity according to sociodemographic variables, health behaviors and morbidities. São Paulo, Vigitel-2017, n = 693.

Variables and categories	OR Crude (95% IC)	p	*OR adjusted (95% IC)	p
Age group		0.113		0.426
60-69	1.00		1.00	
70-79	0.81 (0.54-1.21)		0.89 (0.59-1.34)	
≥80	0.57 (0.33-0.97)		0.69 (0.40-1.20)	
Sex		0.876		0.622
Female	1.00		1.00	
Male	1.03 (0.70-1.50)		0.90 (0.61-1.34)	
Marital relationship		0.185		0.513
Without partner	1.00		1.00	
With partner	1.47 (1.02-2.11)		1.31 (0.87-1.98)	
Race/color		0.101		0.601
White	1.00		1.00	
No White	0.65 (0.41-1.03)		0.79 (0.49-1.27)	
Education (years)		<0.001		<0.001
0-8 years	1.00		1.00	
9-11 years	1.67 (1.04-2.68)		1.65 (1.03-2.65)	
>12 years	3.09 (2.02-4.75)		2.99 (1.93-4.64)	
Occupation		0.113		0.994
No	1.00		1.00	
Yes	1.35 (0.93-1.97)		1.00 (0.65-1.53)	
Health status		<0.001		<0.001
Bad/very bad/do not know	1.00		1.00	
Regular	1.28 (0.47-3.48)		1.28 (0.47-3.51)	
Good	3.23 (1.24-8.42)		2.94 (1.11-7.77)	
Very good	6.37 (2.32-17.41)		5.13 (1.85-14.25)	
High blood pressure		<0.006		0.031
No	1.00		1.00	
Yes	0.60 (0.42-0.86)		0.66 (0.46-0.96)	
Diabetes		0.021		0.077
No	1.00		1.00	
Yes	0.56 (0.34-0.91)		0.63 (0.38-1.05)	
Alcohol consumption		0.043		0.573
No	1.00		1.00	
Yes	1.65 (1.11-2.46)		1.28 (0.83-1.96)	
Smoking		0.172		0.604
No	1.00		1.00	
Yes	0.62 (0.32-1.22)		0.60 (0.30-1.19)	

OR 95% CI = odds ratio - 95% confidence interval; * OR adjusted for age, education and sex

Table IV - Multiple regression model: variables associated with the elderly (over 60 years old) who practice leisure-time physical activity. São Paulo, Vigitel-2017, n = 693.

Variables and categories	OR (95% IC)	p
Education (years)		<0.001
0-8 years	1.00	
9-11 years	1.53 (0.94-2.48)	
>12 years	2.47 (1.58-3.85)	
Health Status		<0.001
Bad/very bad/do not know	1.00	
Regular	1.27 (0.46-3.46)	
Good	2.96 (1.12-7.76)	
Very good	5.14 (1.86-14.23)	

OR IC95% = odds ratio - 95% confidence interval

However, in relation to socioeconomic characteristics, an important variable in epidemiological studies⁽³⁴⁾, the current research pointed out that elderly people with higher education are positively associated with SLTPA, corroborating studies involving both the population aged and over 18 years old⁽¹⁸⁾ as aged ≥ 60 years^(16,22,33).

The adoption of an active lifestyle at leisure reduces the risk of chronic-degenerative diseases and, even, its regularity is an important indicator of incorporating healthier lifestyle habits^(31,32). In addition to controlling and/or preventing both the symptoms of diseases and the maintenance of physical fitness, regular practice also offers psychological benefits, influencing self-rated health⁽²⁸⁾. The association between reporting “very good” and “good” health status and leisure-time physical activity found here corroborates national surveys⁽²⁸⁾.

The present study found that the longer the years of study, the greater the likelihood of reducing health inequities, especially in the most vulnerable groups, given the higher concentration of NCDs and their risk factors in the population with low income and education. It draws attention to the non-association of SLTPA with participants who report some type of CNCD and alcohol consumption, while these characteristics are found in other national studies⁽²²⁾. A survey of 1,950 elderly people living in four areas of the São Paulo region is highlighted⁽²²⁾, which, even after adjusting for age, observed a higher prevalence of elderly individuals active in leisure with up to three chronic diseases when compared to those above four, and among those who drink alcohol on a frequency of 1-3 times a week.

Some limitations should be noted regarding the results of the current study. It is pointed out that the survey does not provide more detailed information on other factors that can influence the practice of physical activity during leisure, such as socio-environmental factors and access to adequate and safe public spaces near the interviewees' residence. In addition, it was observed that the parameters adopted for classification in the SLTPA in the present study are standardized for all age groups. Despite these limitations, the present study has as a strong point the inclusion of a large number of elderly individuals living in the city of São Paulo.

The findings of this research contribute to the monitoring of healthy behavior among the elderly. However, there is a difference in SLTPA according to the sociodemographic profile and health behavior. These characteristics need to be considered when planning and monitoring health policies and in actions to encourage physical activity. It is necessary to emphasize the need for adjustments to the SLTPA promotion and monitoring policies that express the concept of human development, considering the factors associated with human longevity.

CONCLUSION

In the general context, it can be inferred that one in four elderly people living in the city of São Paulo practice enough physical activity at leisure. Among the elderly, the prevalence was higher among the younger ones, male, with a partner, skin color white, with higher education, with occupation, who reported “very good” health status, reported not having chronic diseases, consuming alcohol and not being smoker.

The characteristics with the greatest explanatory power for sufficient physical activity during leisure were higher education and referring to “very good” and “good” health status. This fact reinforces the need for planning and monitoring health policies considering sociodemographic differences and health behaviors for the practice and/or maintenance of leisure-time physical activity among the elderly.

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The authors declare that there are no conflicts of interest.

CONTRIBUTIONS

Bruno Holanda Ferreira and **Olinda do Carmo Luiz** contributed to the preparation and design of the study; the acquisition, analysis and interpretation of data and the writing and revision of the manuscript. **Bruna Gabriela Marques** contributed to the acquisition, analysis and interpretation of data and the writing and revision of the manuscript.

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