Factors associated with high exposure to sedentary behavior in older adults: analysis of data from the National Health Survey, 2019

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Abstract

Objective: To analyze the factors associated with sedentary behavior in older adults. *Method*: A cross-sectional study of data from the 2019 National Health Survey involving 22,728 older Brazilian adults was conducted. The outcome was sedentary behavior and the exposures included sociodemographic characteristics, lifestyle, household characteristics and chronic diseases. Multiple logistic regression was used: with a significance level of 5%. *Results*: The prevalence of sedentary behavior was 32.8% (95%CI: 31.8-33.8) There was a greater chance for the outcome in individuals that were female (OR=1.20; 95%CI: 1.08-1.34); aged 70-79 years (OR= 1.22; 95%CI: 1.09-1.36); aged ≥80 years (OR=1.18; 95% CI: 1.02-1, 36); had no partner (OR= 1.27; 95%CI: 1.14-1.41); were diabetic (OR =1.17; 95%CI: 1.06-1.30), had systemic arterial hypertension (OR =1.34; 95%CI: 1.18-1.51). previous stroke (OR = 1.61; 95%CI: 1.32-1.96), and no place to perform physical activity close to home (OR=1.16; 95%CI: 1.05-1.29). Older adults with low education (OR= 0.71; 95%CI: 0.61-0.82), and that resided in rural areas (OR=0.53; 95%CI: 0.47-0.61) were less likely to be sedentary. *Conclusion:* Individuals that were female, older(ager > 70 years), had diabetes, hypertension, previous stroke, and no place to perform physical activity close to home, were associated with high exposure to sedentary behavior. Living in rural areas and having less education were inversely associated with this risk behavior.

Keywords: Aging. Sedentary Behavior. Epidemiology.

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INTRODUCTION

Sedentary behavior can be defined as any behavior characterized by an energy expenditure of 1.5 or less metabolic equivalents (METs) in a sitting, reclining or lying position[1]. Screen time (television, computer, tablet, smartphone) in a seated, recline or laying down position, as well as activities such as reading, writing and speaking in a seated position in a bus, car or train, are examples of sedentary behavior in adults and older individuals[1].

Sedentary behavior time is increasing globally and older people constitute the age strata with the highest prevalence of this lifestyle[2]. There is robust evidence that longer sedentary behavior time is associated with a number of different chronic non-communicable diseases (NCDs), such as type II diabetes, cancers, cardiovascular diseases, besides obesity and multimorbidity, and impacts cardiovascular-related and all-cause mortality[3]. Chronic NCDs alone account for 74% of all deaths worldwide[4].

It should be noted that sedentary behavior is a modifiable risk factor for these chronic conditions and a potential variable of focus in both the prevention and treatment/control of these diseases[5,6]. Moreover, evidence shows that, irrespective of level of physical activity, exposure to sedentary behavior can have deleterious effects on health[7]. However, recent evidence also suggests that the effects of sedentary behavior can be attenuated by increasing energy expenditure through engagement in moderate-to-vigorous physical activity[8].

International studies reveal that children, adolescents, adults and older individuals have a high prevalence of sedentary behavior. North-Americans, for example, watched an estimated 2 hours or more of television and videos daily[9]. In 2019, 34.7 million Brazilians (21.8% of adult population) reported watching television for 3 hours or more per day[10]. By comparison, in 2013, this rate was observed in 29.0% of people aged 18 or older[10].

Studies exploring this issue are relatively recent and have grown in the last 10 years[11]. Also, study results are conflicting regarding the association of sociodemographic characteristics, such as sex and marital status, with sedentary behavior in older people, with no consensus on whether an association exists[12-14]. Moreover, there is a dearth of studies based on nationally representative data estimating the prevalence of this risk behavior in the older population in Brazil, with some studies limited to specific regions and/or states in the country[15].

Against this background, given the potential impacts of sedentary behavior on health and mortality, together with the gaps outlined, the present study draws on a nationally-distributed sample. The results can contribute to the field of health management and health care and treatment for older individuals by shedding light on the extent of sedentary behavior among older Brazilians, while promoting a deeper understanding of sociodemographic factors, characteristics pertaining to households, and of chronic conditions which may be associated with high exposure to sedentary behavior.

This knowledge is important to help identify groups in the older population that have greater exposure to sedentary behavior and thereby guide actions aimed at reducing this exposure time and mitigating the deleterious health effects in these individuals. Thus, the objective of the present study was to analyze the factors associated with sedentary behavior in older people.

METHOD

A cross-sectional analytical study drawing on secondary data from the 2019 National Health Survey (PNS) was conducted. The PNS micro-datasets are available from the website of the Brazilian Institute of Geography and Statistics (IBGE): http://www.ibge.gov.br. The PNS is a household survey whose data are representative of the population living in private households nationwide, intended to provide information on the health determinants, mediating factors and needs of the Brazilian population[16].

The sampling plan for the PNS was based on 3-stage clustering. Census sectors were made up of primary sample units (PSUs), giving a total of 8,036. Within each PSU, a fixed number of permanent private households were selected using random sampling (15 households/PSU or 18 households/PSU, depending on the Brazilian state)[10]. A total of

108,457 households were selected for all Brazil, and 94,114 household interviews conducted[16]. Within each household, a dweller aged 15 years or older was selected using simple random sampling to answer a specific questionnaire[16]. Overall, a total of 90,846 individual interviews with the selected dwellers were carried out[10].

Households located in census sectors with small populations, e.g., indigenous areas, barracks, housing estates, encampments, boats, penitentiaries, penal colonies, military bases, prisons, jails, long-term care facilities for older people, care homes for children and adolescents, convents, and hospitals etc. were excluded from the PNS[10].

The population included in the study comprised 90,846 respondents of individual interviews at the third stage of selection of the PNS[10]. The sample included only older people, from all Brazilian states, that completed the individual interview. The sample employed in the present study consisted of 22,728 community-dwelling older people, selected by simple random sampling for all Brazilian states[16].

The PNS used a questionnaire devised and validated by Health Ministry technicians that underwent pilot testing and contained 3 parts: household, questionnaire for all dwellers in the household, and a questionnaire applied to the selected dweller[15]. The present study drew on data from the following questionnaire modules: Module C (general characteristics of the dwellers); Module D (characteristics of education of the dwellers); Module P (lifestyles) and Module Q (Chronic diseases); and Module M (Employment and Social Support).

Data collection took place between August 2019 and March 2020 by IBGE technicians and with the aid of a mobile device[14]. Data collection agents were previously trained by heads of the state units[15]. Prior to collection, the agent explained the objectives of the survey, the collection procedure itself and the importance of the dweller taking part[14]. Further details on the method for the 2019 PNS can be found in a methodological article about the survey[15].

The outcome of interest was sedentary behavior. This variable was based on 2 questions: On average, how many hours per day do you usually watch television? In a day, how many hours of your free time do you usually use a computer, tablet or cell phone for leisure, such as: to use social networks, see the news, watch videos, play games etc.? Sedentary behavior was defined as habitually spending 3 or more hours a day watching TV or using other screens[10]. Thus, this variable was categorized as: 0- does not exhibit sedentary behavior (uses TV or other screens for less than 3 hours/day; and 1- exhibits sedentary behavior (watches TV and other screens for 3 or more hours per day).

The components of the social network of the older respondents (number of friends and family members the elder can count on for almost everything, and frequency of meetings with others to engage in physical activity) were considered, adjusting for confounding variables, given that sedentary behavior or lifestyle are influenced by social network contacts, as described in the theoretical model of the Social Determinants of Health proposed by Dalgreen & Whithead[17].

Descriptive analyses of the exposures and outcomes was performed. Results were expressed as measures of simple frequency and percentage with respective 95% Confidence Intervals (95%CI). For the descriptive analysis of the outcome, an analysis stratified by sociodemographic characteristics was carried out.

To assess the association of the independent variables with sedentary behavior, a bivariate step was employed involving the chi-square test to determine possible differences in the distributions of proportions. In this step, variables with a p-value <0.20 were selected for inclusion in the multiple logistic regression model. The measure of association used was Odds Ratio (OR).

For the multiple analysis, the Stepwise method using Forward criteria was used, in which all variables selected in the bivariate stage were input one by one into each model. This procedure reveals changes in the size of the odds ratios and tests possible interactions after introducing each variable individually.

The introduction of variables began with the outcome, and the exposures of interest were then introduced in a stepwise fashion, with subsequent inclusion of confounding factors. The variables which remained associated, with level of significance <5% on the Wald test, were included in the adjusted models. For the purpose of analysis, 2 multiple models were built. The first model was adjusted for sociodemographic characteristics, place near household to engage in physical activity, and chronic diseases. The second multiple model was adjusted for characteristics of the first model, plus the confounding factors of the social network.

Besides the probability value of the Wald test, for analysis of the variables associated with sedentary behavior in multiple models, the 95% Confidence Interval (95%CI) was also used as a hypothesis test. In cases where the 95%CI of the adjusted OR exceeded 1.00, the exposure variable was considered not to be associated with sedentary behavior.

The Goodness-of-fit test for the *svy* module was used to check the fit of the final individual models. On the descriptive, bivariate and multivariate analyses, the sample weights were used to calibrate the complex sample design. The analyses were carried out on the Survey module for complex samples using data processing software.

The study drew on secondary data from the 2019 PNS, available for access in the public domain and, thus, approval of the project by the Research Ethics Committee was waived since the microdata sets provided by the IBGE ensured confidentiality and anonymity of the participants, whose identities could not be discerned by manipulating the data. Therefore, this study met the requirements of resolution 466/12 of the National Board of Health, guaranteeing confidentiality and anonymity of participants in compliance with ethical precepts.

RESULTS

The sample comprised participants that were predominantly women (55.5%; 95%CI:545-56.5), aged 60-69 years (54.8%: 95%CI: 53.8-55.8), self-declaring as white (51.3%:95%CI: 50.2-52.4) and low-educated – 0-8 years (70.4%; 95%CI: 69.2-71.5). Regarding area of residence, the majority of participants lived in the urban area (85.5%) (Table 1).

The rate of high exposure to sedentary behavior was 32.8% (95%CI: 31.8-33.8). Also, there was a higher rate of this risk behavior in participants that were female (35.6%; 95%CI: 34.2-37.1), aged 70-79 years (35.3%; 95%CI: 33.4-37.3) and ≥80 years (34.4%; 95%CI: 31.7-37.2), and with higher socioeconomic level "Class A" 44.4% (95%CI: 36.1-53.2). Further information is given in Table 2.

The unadjusted analysis of the sociodemographic factors, characteristics of the household neighborhood and chronic disease with sedentary behavior of the participants revealed that female gender (OR = 1.34; 95%CI: 1.22-1.48); older age groups – ≥ 80 years (OR = 1.35; 95%CI: 1.17-1.55) and 70-79 years (OR =1.21; 95%CI: 1.08-1.34); marital status without partner (OR = 1.36; 95%CI: 1.24-1.49); having no area nearby for physical activity (OR = 1.37; 95%CI: 1.24-1.50); having diabetes (OR =1.40; 95%CI: 1.25-1.57); Systemic Arterial Hypertension (OR =1.24; 95%CI: 1.12-1.36); or stroke (OR = 1.60; 95%CI: 1.32-1.92), were positively associated with sedentary behavior in participants (Table 3).

Also on the unadjusted analysis, brown skin color (OR = 0.82; 95%CI: 0.74-0.90), low education of 0-8 years (OR = 0.70; 95%CI= 0.61-0.80), belonging to social classes C, D and E (OR = 0.57; 95%CI: 0.58-1.28), and living in a rural area (OR = 0.39; 95%CI: 0.35-0.44), were associated with lower odds of sedentary behavior (Table 3).

On the multivariate analysis (model 2), sedentary behavior remained positively associated with female gender (OR = 1.20; 95%CI: 1.08-1.34); age groups 70-79 years (OR = 1.22; 95%CI: 1.09-1.36) and ≥80 years (OR = 1.18; 95%CI: 1.02-1.36); having no partner (OR = 1.27; 95%CI: 1.14-1.41); living in the Southeast (OR = 1.85; 95%CI: 1.59-2.15), Northeast (adjusted OR=1.40; 95%CI: 1.21-1.63) or South (OR = 1.36; 95%CI: 1.15-1.62) regions compared with the Mid-West, and not having anywhere to do physical activity nearby (OR = 1.16; 95%CI:1.05-1.29) (Table 3).

In addition, the outcome remained associated with chronic health conditions, such as: Diabetes (OR = 1.17; 95%CI: 1.06-1.30); Systemic Arterial Hypertension (OR =1.34; 95%CI: 1.18-1.51); and Stroke (OR = 1.61; 95%CI: 1.32-1.96) (Table 3). On the adjusted analysis, only low education (0-8 years) (OR = 0.71; 95%CI: 0.61-0.82) and living in a rural area (OR = 0.53; 95%CI: 0.47-0.61) continued to reduce the odds for sedentary behavior (Table 3).

Table 1. Sociodemographic characteristics of older adults brazilians (n=22,728). Brazil, 2019.

Sociodemographic characteristics	n[a] (%[b])	95%CI[c]
Sex		
Male	10,193 (44.5)	43.5-45.5
Female	12,535 (55.5)	54.5-56.5
Age group		
60-69 years	12,555 (54.8)	53.8-55.8
70-79 years	7,157 (31.1)	30.2-32.0
≥ 80 years	3,016 (14.1)	13.3-14.8
Skin color**		
White	9,901 (51.3)	50.2-52.4
Black	2,455 (10.2)	9.6-10.8
Brown	10,001 (36.7)	35.7-37.7
Yellow or Indigenous	369 (1.8)	1.5-2.1
Marital status		
With partner	9,946 (43.3)	42.3-44.3
Without partner	12,782 (56.7)	55.7-57.8
Education		
≥12 years	2,701 (13.1)	12.2-13.9
9-11 years	3,616 (16.5)	15.7-17.4
0-8 years	16,414 (70.4)	69.2-71.5
Social Class*		
A	240 (1.5)	1.1-2.0
B	2,810 (13.8)	12.9-14.7
C, D and E	19,675 (84.7)	83.5-85.7
Area of residence		
Urban	17,313 (85.5)	84.8-86.1
Rural	5,415 (14.5)	13.9-15.2
Region		
Southeast	5,825 (46.4)	45.3-47.6
South	3,307 (15.7)	15.0-16.4
Mid-West	2,373 (6.4)	6.0-6.8
North	3,487 (6.1)	5.7-6.4
Northeast	7,736 (25.4)	24.5-26.2

[a] Sample size; [b] Population estimate in Survey, based on weightings of complex sampling plan; [c] 95% Confidence Interval; **Variable has 2 missing values. * Variable has 3 missing values.

Table 2. Prevalence of sedentary behavior in older Brazilians according to sociodemographic variables (n=22,728). Brazil, 2019.

Sociodemographic characteristics	Sedentary Behavior (SB)[1]		
	Yes[a]	No[b]	
	% (95%CI)	% (95%CI)	*p-value*[c]
Sex			
Male	29.1 (24.5-27.4)	70.9 (69.4-72.3)	<0.0001
Female	35.6 (34.2-37.1)	64.4 (62.9-65.8)	
Age group			
60-69 years	31.1 (29.8-32.4)	68.9 (67.6-70.2)	0.0008
70-79 years	35.3 (33.4-37.3)	64.7 (62.7-66.6)	
≥80 years	34.4 (31.7-37.2)	65.6 (62.2-68.2)	
Skin color**			
White	34.2 (32.7-35.8)	65.8 (64.3-67.3)	0.0009
Black	35.9 (32.7-39.2)	64.1 (60.7-67.3)	
Brown	29.9 (28.4-31.4)	70.1 (68.5-71.5)	
Yellow or Indigenous	36.3 (27.5-45.9)	63.7 (54.0-72.4)	
Marital status			
With partner	29.4 (28.0-30.8)	70.6 (72.9-75.7)	< 0.0001
Without partner	36.3 (34.8-37.7)	63.7 (64.9-67.8)	
Education			
≥12 years	37.9 (35.0-40.9)	62.1 (69.1-64.9)	< 0.0001
9-11 years	40.5 (37.8-43.1)	59.5 (56.8-62.1)	
0-8 years	30.0 (28.8-31.1)	70.0 (68.8-71.1)	
Social Class*			
A	44.4 (36.1-53.2)	55.6 (46.7-63.9)	<0.0001
B	37.9 (34.9-40.9)	62.1 (59.0-65.0)	
C, D and E	31.5 (30.5-32.6)	68.4 (67.3-69.5)	
Area of residence			
Urban	35.3 (34.2-36.4)	64.6 (63.5-65.7)	<0.0001
Rural	17.8 (16.3-19.4)	82.1 (80.5-83.6)	
Region			
Mid-West	24.4 (22.2-26.7)	75.7 (73.2-77.7)	<0.0001
North	24.5 (22.4-26.8)	75.4 (73.1-77.5)	
South	29.1 (26.8-31.5)	70.8 (68.4-73.1)	
Northeast	28.7 (27.2-30.3)	71.2 (69.6-72.7)	
Southeast	38.4 (36.7-40.2)	61.5 (59.7-63.2)	

[1] SB defined as time using TV and other screens (computer, tablets or cell phone) of > 3 hours per day; [a] SB prevalence according to sociodemographic characteristics for 95% confidence interval; [b] Non-SB prevalence according to sociodemographic variables; [c] probability value for chi-square test; **Variable has 2 missing values. * Variable has 3 missing values.

Table 3. Association of sociodemographic factors, household neighborhood characteristics and presence of chronic diseases with sedentary behavior in older Brazilians (n=22,728). Brazil, 2019.

Variables	Sedentary Behavior (SB)			
	unadjusted OR[a] (95%CI)[d]	p-value[e]	Model 1 OR adjusted[b] (95%CI)	Model 2 OR adjusted[c] (95%CI)
Sex (ref. Male)				
Female	1.34 (1.22-1.48)	<0.001	1.20 (1.07-1.33)	1.20 (1.08-1.34)
Age group (ref. 60-69 years)				
70-79 years	1,21 (1,08-1,34)	<0.001	1.21 (1.09-1.36)	1.22 (1.09-1.36)
≥80 years	1,35 (1,17-1,55)	0.031	1.18 (1.02-1.36)	1.17 (1.01-1.35)
Skin color (ref. White)**				
Black	1.07 (0.92-1.25)	0.360	-	-
Brown	0.82 (0.74-0.90)	0.001	-	-
Other (Yellow or Indigenous)	1,09 (0,72-1,65)	0.674	-	-
Marital status (ref. With partner)				
Without partner	1,36 (1,24-1,49)	<0.001	1.27 (1.14-1.41)	1.27 (1.14-1.41)
Education (ref. ≥12 years)				
9-11 years	1,11 (0,93-1,31)	0.215	-	-
0-8 years	0.70 (0.61-0.80)	<0.001	0.74 (0.64-0.80)	0.71 (0.61-0.82)
Social Class (ref. A)*				
B	0.76 (0.59-1.33)	0.154	-	-
C, D and E	0.57 (0.58-1.28)	0.002	-	-
Zone of residence (ref. Urban)				
Rural	0.39 (0.35-0.44)	<0.001	0.53 (0.46-0.60)	0.53 (0.47-0.61)
Region (ref. Mid-West)				
North	1.00 (0.85-1.19)	0.934	-	-
South	1,27 (1,07-1,50)	0.005	1.36 (1.15-1.62)	1.39 (1.17-1.65)
Northeast	1.24 (1.08-1.43)	0.003	1.40 (1.21-1.63)	1.39 (1.20-1.62)
Southeast	1.93 (1.67-2.22)	<0.001	1.86 (1.61-2.16)	1.85 (1.59-2.15)
Place nearby for physical activity (ref. Yes)				
No	1.37 (1.24-1.50)	<0.001	1.16 (1.05-1.29)	1.17 (1.06-1.30)
Diabetes (ref. No)				
Yes	1.40 (1.25-1.57)	<0.001	1.35 (1.20-1.53)	1.34 (1.18-1.51)
HAS (ref. No)				
Yes	1.24 (1.12-1.36)	<0.001	1.14 (1.03-1.27)	1.15 (1.04-1.28)
Stroke (ref. No)				
Yes	1.60 (1.32-1.92)	<0.001	1.63(1.34-1.99)	1.61 (1.32-1.96)
Chronic back problem (ref. No)				
Yes	1.02 (0.92-1.13)	0.694	-	-
Depression (ref. No)				
Yes	1.19 (1.02-1.38)	0.020	-	-

[a] Unadjusted odds ratio; [b] Odds ratio adjusted for sociodemographic characteristics, place near household for physical activity, and chronic diseases; [c] Odds ratio adjusted for sociodemographic characteristics, place near household for physical activity, chronic diseases, and confounding factors of social network. [d]95% Confidence Interval. [e] probability value from Wald´s test.

DISCUSSION

The results of this study showed that around a third of the older residents of private households in Brazil spent 3 hours or more using screens, including television, smartphones, computer, tablets among others. This behavior was found to be more common in participants who were from older age groups, living without a partner and high-educated.

These findings are consistent with a previous study in European countries which reported a prevalence of sedentary behavior of 37.1%, albeit for a cut-off of over 5.5 hours per day of screen time[18]. In Brazil, higher prevalences of this behavior, ranging from 53%[19] and 68.8%[20], have been observed in community-dwelling older adults.

However, these higher estimates might be explained by the fact they were established in lockdown during the COVID-19 pandemic[19]. The wide range of prevalence might also be due to different definitions of sedentary behavior, with a lack of consensus among studies regarding the metrics adopted, e.g., which activities are performed in a sitting position, and the cut-off point for time in this position[21].

Conversely, another study found that sedentary behavior was more common among older married people, and was more frequent in high-educated older individuals and in the top-income quartile - relationships corroborated by the present findings[2].

Irrespective of the components of social media, sedentary behavior was positively associated with female gender in the present investigation. By contrast, the results of a recent review involving institutionalized older individuals found that men from older age groups were more vulnerable than women to a sedentary lifestyle[21]. One study showed than men watched less TV daily than women[13], whereas another found no gender difference for sedentary behavior patterns[14].

With regard to age, in the present study, a positive association between older age groups and sedentary behavior was evident, whereas another study found an inverse relationship between this behavior and age[22]. For example, oldest-old (i.e., ≥70 years of age), can be more prone to sedentary behavior, owing to physiological and neurophysiological declines, natural or otherwise, associated with aging, preventing a routine involving domestic, sports or leisure-time activities, with the result that the individual has longer screen time as a recreational pursuit[23].

Another important finding of the present study was that low level of education and living in a rural area reduced the likelihood of sedentary behavior, suggesting this pattern may be correlated with the economic and social level of the individual. The explanation for this result may be directly linked with poorer access to technological tools and with work activities involving more manual activities among individuals with a lower educational level and, hence, lower income. Low-educated individuals may be exposed to work situations involving greater energy expenditure, carrying out manual activities which reduce sedentary behavior.

Thus, the way in which people engage with their surrounding environment is pivotal toward maintaining good health and quality of life. Hence, older individuals living in rural areas are able to be better connected with the environment and more able to maintain their formal and social relationships, engaging in group activities to improve health and prevent loneliness which, in turn, can contribute to reducing sedentary behaviors[24].

In the present study, participants with type II diabetes, high blood pressure or history of stroke were more likely to be sedentary than their counterparts without these conditions, highlighting that time spent sedentary constitutes a good predictor of the presence of diabetes mellitus[25]. Diabetics have a higher risk of developing diabetic foot, a condition responsible for 60-70% of lower-limb amputations, preventing these individuals from leading a less sedentary life[26].

Consistent with the present findings, a previous international study found an association between being hypertensive and higher risk of exhibiting sedentary behavior[27]. Moreover, there is a consensus that sedentary behavior may be a factor that increases the risk of arterial hypertension. Individuals affected by stroke typically remain in a sitting or lying position, due to the sequela of the infarction event,

which causes disabilities that can limit mobility and preclude the performing of physical activity[28,29].

In addition, older individuals that spend over 3 hours a day in a sedentary state are more likely to have 2 or more chronic health conditions compare to those who are sedentary for less than 3 hours daily[20]. Therefore, engagement in physical activity, besides being protective against these chronic diseases, also contributes to their treatment and control, representing a potential strategy for implementation in groups of older people, including among hypertensive and diabetics. People who remain sedentary are more prone to doing less physical activity during their leisure-time and to having higher adiposity[30].

However, the result of this study revealed that sedentary behavior was more prevalent in the Southeast which, although one of the most developed and populous regions, also has lower availability of inclusive places for older people to perform leisure-time physical activity[10]. This lack of venues may partially explain why older individuals from this region have a greater risk of sedentary behavior compared to those living in the Mid-West.

This situation highlights the need for areas that are more accessible to older users, given this group may have lower ability to engage in leisure-time activity and, as a consequence, spend more time on activities that demand low energy expenditure. This pattern of activity may result in these individuals being more housebound with negative impacts on quality of life, mental health, and on the development of chronic diseases, cancerous cells and mortality[4,30].

This need is corroborated by the study findings showing that, irrespective of sociodemographic aspects, having chronic diseases such as DM, SAH and stroke, components of the social network, a lack of venues to engage in physical activity near home, can all increase the chances of the older individual spending 3 or more hours per day in a sitting or lying position using screens.

Performing at least 150 minutes of moderate physical exercise, or 75 minutes of intense or vigorous exercise, per week promotes positive effects for healthy functioning of people aged 65 years or older[31]. Nevertheless, remaining in a sitting position for long periods of time, for example, can have deleterious health effects, regardless of the level of physical activity performed[7].

Therefore, exposure time to sedentary behavior should be mitigated, i.e., health professionals should encourage older individuals to incorporate frequent breaks in sedentary behavior, switching to a standing position, particularly at nighttime, because this can help maintain and improve physical health, by improving upper-limb strength for example[32]. Additionally, experimental evidence suggests that remaining in the standing rather than sitting position for 2 hours, increases muscle activity, improving lipid oxidation and glycemia[33].

This study has some limitations, for instance, the past pattern of exposures regarding the outcome could not be ascertained, particularly for chronic diseases and, hence, the relationships found are associative in nature and do not reflect cause and effect. Nonetheless, the data reported are representative for Brazil, conferring greater accuracy to estimates of sedentary behavior in older people and to the external validity of the study.

CONCLUSION

Drawing on representative data for Brazil, a third of the older individuals investigated exhibited sedentary behavior at the time of the survey. Participants who were female, from older age groups (≥70 years), diabetic, hypertensive, with history of stroke, and high-educated may be more susceptible to exposure to sedentary behavior.

Moreover, older participants residing in the Southeast, Northeast or Southern regions may be more prone to being sedentary than those living in the Mid-West. The lack of places to engage in physical activity nearby also emerged as a potential factor which may increase the likelihood of sedentary behavior in older people. The use of facilities in the neighborhood that encourage engagement in physical activities should be promoted as a government initiative, involving actions and programs linked to public policies for health promotion in the older population.

Also, health professionals should encourage older people, particularly those who spend more time engaged in sedentary behavior, to adopt a strategy of breaks in sedentary periods, alternating with the standing position, as an alternative to mitigate the impact of high exposure to this risk behavior.

The study findings can help inform public policymaking toward devising strategies that mitigate time engaged in sedentary behavior in the older population. Lastly, the results can aid health professionals who are directly involved in promoting health education actions.

AUTHOR CONTRIBUTIONS

- Oliveira-Figueiredo DST – Study conception, data analysis and interpretation, writing and approval of draft to be published.
- Silva MPGPC – data analysis and interpretation, writing and approval of draft to be published.
- Feitosa PYO – writing and approval of draft to be published.
- Miranda APM – writing and approval of draft to be published.

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