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Bruno Prates Freitas

**Comportamento sedentário, obesidade e incapacidade funcional em idosos  
comunitários: Análise da Pesquisa Nacional de Saúde (PNS) de 2019**

Araranguá

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Orientadora: Prof<sup>a</sup>. Dr<sup>a</sup> Núbia Carelli Pereira de Avelar

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## **BANCA EXAMINADORA**

**Orientadora:** Prof<sup>ª</sup>. Dr<sup>ª</sup>. Núbia Carelli Pereira de Avelar

**Membro 1:** Jaqueline Betta Canever

**Membro 2:** Letícia Martins Cândido

**Membro Suplente:** Prof<sup>ª</sup>. Dr<sup>ª</sup> Heloyse Uliam Kuriki

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*Aos formuladores e executores do  
programa de Vagas Suplementares para  
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**Comportamento sedentário, obesidade e incapacidade funcional em idosos  
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**RESUMO**

Comportamento sedentário (CS) e obesidade são descritos como problemas de saúde pública. Todavia, carecem estudos nacionais que analisem a associação simultânea dessas condições com a incapacidade funcional. O conhecimento dessas associações poderá contribuir para a proposição de ações e políticas de promoção de autonomia para pessoas idosas. Assim, o objetivo deste estudo foi investigar a associação de obesidade e CS, assistindo televisão (CS TV) e no lazer (CS lazer), com a presença de incapacidade nas atividades básicas (ABVD) e instrumentais da vida diária (AIVD) em idosos comunitários. Tratou-se de um estudo transversal, com dados de 22.728 idosos participantes da Pesquisa Nacional de Saúde de 2019. Os desfechos foram às incapacidades nas ABVD e AIVD e as variáveis de exposição foram diferentes categorias, que englobaram obesidade, CS TV e CS lazer, analisadas separada e conjuntamente. Observou-se que CS TV (OR: 1,26; IC95%: 1,14; 1,39), obesidade (OR: 1,21; IC95%: 1,07; 1,36) e CS TV + obesidade (OR: 1,55; IC95%: 1,37; 1,75) tiveram associações positivas com a incapacidade nas ABVD. Já CS TV (OR: 1,38; IC95%: 1,24; 1,54) e CS TV+ obesidade (OR: 1,25; IC95%: 1,12; 1,40) foram associados positivamente à incapacidade nas AIVD. Ainda, CS lazer foi associado positivamente com a presença de incapacidade nas ABVD (OR: 1,28; IC95%: 1,18; 1,39) e negativamente com a incapacidade nas AIVD (OR: 0,56; IC95%: 0,41; 0,76). Concluiu-se que o CS TV aumentou as chances de incapacidades nas ABVD e nas AIVD, enquanto a obesidade isolada aumentou as chances de incapacidade somente nas ABVD. Por outro lado, o CS lazer diminuiu as chances de incapacidade somente nas AIVD.

**Palavras-chave:** Comportamento sedentário; atividades da vida diária; envelhecimento.

**ABSTRACT**

Sedentary behavior (SB) and obesity are relevant public health concerns, although there are few researches analyzing the association of these conditions with disabilities in activities of daily living. Thus, this study investigated the association between obesity and SB typologies with disabilities in basic activities (BADL) and instrumental activities of daily living

(IADL) in community-dwelling Brazilian older adults. A cross-sectional study was conducted with data from 22,728 elderly participants of the 2019 Brazilian National Health Survey. The outcomes were disabilities in BADL and IADL and the independent variables were different categories, including obesity, daily time of sedentary behavior watching television (SB TV), and daily time of sedentary behavior in leisure activities (SB leisure), which were analyzed separately and jointly. The SB TV (OR: 1.26; 95% CI: 1.14; 1.39), obesity (OR: 1.21; 95% CI: 1.07; 1.36), and SB TV + obesity (OR: 1.55; 95% CI: 1.37; 1.75) were positively associated with disability in BADL, whereas SB TV (OR: 1.38; 95% CI: 1.24; 1.54) and SB TV + obesity (OR: 1.25; 95% CI: 1.12; 1.40) were positively associated with disability in IADL. Nevertheless, isolated SB leisure was positively associated with the disability in BADL (OR: 1.28; 95% CI: 1.18; 1.39) and negatively with disability in IADL (OR: 0.56; 95% CI: 0.41; 0.76). In conclusion, SB TV alone or associated with obesity increased the odds of disabilities in both types (i.e., BADL and IADL). In contrast, isolated obesity only increased the odds of disability in BADL, and SB leisure alone only reduced the odds of disability in IADL.

**Keywords:** Sedentary Behavior; Obesity; Activities of Daily Living; Ageing.



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**AUTHORS**

Bruno Prates Freitas<sup>1</sup> <https://orcid.org/0000-0002-6093-5129>

Letícia Martins Cândido<sup>2</sup> <https://orcid.org/0000-0002-3564-5322>

Núbia Carelli Pereira de Avelar<sup>1</sup> <https://orcid.org/0000-0003-4212-4039>

Katia Jakovljevic Pudla Wagner<sup>3</sup> <https://orcid.org/0000-0002-3649-3121>

Ana Cristina Rodrigues Lacerda<sup>4</sup> <https://orcid.org/0000-0001-5366-3754>

Vanessa Amaral Mendonça<sup>4</sup> <https://orcid.org/0000-0002-1696-6091>

Roberta De Micheli<sup>5</sup> <https://orcid.org/0000-0002-4902-2636>

Alessandro Sartorio<sup>5</sup> <https://orcid.org/0000-0002-9620-4133>

Ana Lúcia Danielewicz<sup>1,2,5</sup> <https://orcid.org/0000-0003-1563-0470>

1 Department of Health Sciences, Federal University of Santa Catarina – Ararangua – Santa Catarina – Brazil

2 Graduate Program in Rehabilitation Sciences, Federal University of Santa Catarina – Ararangua – Santa Catarina – Brazil

3 Special Coordination of Biosciences and Single Health, Federal University of Santa Catarina – Curitibanos – Santa Catarina – Brazil

4 Federal University of the Jequitinhonha and Mucuri Valleys - Diamantina – Minas Gerais – Brazil

5 Istituto Auxologico Italiano, IRCCS, Experimental Laboratory for Auxo endocrinological Research, Piancavallo-Verbania and Milan, Italy

## INTRODUCTION

Sedentary behavior (SB) can be performed in different activities, such as the time spent in front of screens (e.g., televisions, computers, or tablets), reading, eating, socializing, working, and driving vehicles <sup>1</sup>. Silveira et al. (2022) <sup>2</sup> estimated that 31% of the adult and elderly population in Africa, America, Europe and Oceania spend excessive periods in at least one of these SB per day. In older adults, SB in front of screens for >3 h/day requires attention as it is associated with morbidities <sup>3</sup>, including type II diabetes mellitus <sup>4,5</sup>, systemic arterial hypertension <sup>4</sup>, depression <sup>6</sup> and heart <sup>4</sup>, respiratory <sup>7</sup>, joint <sup>8,9</sup>, and musculoskeletal <sup>10,11</sup> diseases. Furthermore, evidences had shown that SB is closely associated with obesity <sup>2,4</sup>.

The prevalence of obesity in the elderly population was estimated to be around 19.0% between 2005 and 2013 in Europe <sup>12</sup>, while in the United States, it was 37.5% in men and 39.4% in women over 60 years old in 2014 <sup>13</sup>. In Brazil ranged from 17.9% for those aged 65 to 74 years and 15.8% for those aged 75 years or older in 2019 <sup>14</sup>. Obesity is a relevant and growing public health problem in the world as it is associated with various chronic diseases <sup>15,16,17,18,19</sup>, muscle mass decrease <sup>20</sup>, early mortality <sup>21</sup>, and disabilities <sup>22,23</sup>.

Disabilities in basic activities of daily living (BADL) and instrumental activities of daily living (IADL) are highly prevalent, affecting 17.6 and 46.3% of the Brazilian older people, respectively <sup>24</sup>. The ability to independently perform BADL and IADL is impaired by excessive time in SB due to decreased aerobic resistance, agility, dynamic balance, and poor dietary quality <sup>25</sup>. In addition, obesity can be an aggravating factor in this association due to the increased load on joint structures and chronic inflammatory state associated with adipose tissue accumulation, factors which lead to osteoarticular and physical performance impairments <sup>26</sup>.

Gomes et al. (2021) <sup>22</sup> performed a systematic review that analyzed community-dwelling people over 60 years old and investigated the relationship between different forms of assessing the SB (e.g., number of steps per day, metabolic equivalents, and moderate and vigorous physical activity) with the presence of disabilities; in all longitudinal and most cross-sectional studies, the authors found that SB was associated with disabilities in BADL and IADL. However, in most studies that investigated the association between SB and disabilities, the samples consisted of individuals with specific clinical conditions such as fractures, osteoporosis, and joint symptoms <sup>27,28,29,30</sup>. Moreover, data on the association between obesity and disabilities in the older people remains scarce <sup>31,32,33</sup>, although there are consistent data on the isolated association of SB in its various forms or obesity with functional disabilities <sup>22,33</sup>. Nonetheless, no studies were found until present moment that analyzed SB typologies and obesity jointly with disabilities outcomes in BADL and IADL in Brazilian community-dwelling

older adults <sup>22,34,35,36</sup>. Given this context, this study innovates by performing simultaneous and isolated analyses of the association between obesity and different types of SB with disabilities in BADL and IADL in a sample of Brazilian community-dwelling older adults without specific comorbidities <sup>37</sup>.

Shedding more light on the factors associated with disabilities is crucial as it can contribute to developing actions and public policies focused on prevention of these modifiable behaviors and, consequently, other negative outcomes <sup>38,39</sup>. Therefore, this study investigated the association between obesity and SB typologies with disabilities in basic activities and instrumental activities of daily living in community-dwelling Brazilian older adults.

## **METHODOLOGY**

### **STUDY DESIGN AND POPULATION**

A cross-sectional study with secondary data of the 2019 National Health Survey carried out by the Brazilian Institute of Geography and Statistics (IBGE) and approved by the National Research Ethics Committee of the National Health Council <sup>40,41</sup>. Only data from the sampled elderly population ( $\geq 60$  years) were analyzed.

### **SAMPLING AND DATA COLLECTION**

Sampling was formulated by clusters in three stages. In the first, the primary sampling units were stratified based on a pre-established set of sections of the national territory used for studies by the IBGE Integrated Household Survey System — the master sample. In the second stage, a fixed number of households registered in the National Register of Addresses for Statistical Purposes were selected in each primary sampling unit by simple random sampling. The third stage consisted of randomly choosing a resident aged 15 or older in each household to answer the survey questionnaire. The interviews were scheduled according to the participants convenience, and two or more visits were scheduled for each household <sup>37,40</sup>. The inclusion criterion for this study was only individuals aged 60 or older who had answered all questionnaires and/or variables of our interest. More information about the sampling process and data collection is provided in a previous study <sup>41</sup>.

### **INDEPENDENT VARIABLES**

The SB was evaluated through the following questions: (1) “*On average, how many hours a day do you usually watch television (TV)*” and (2) “*In a day, how many hours of your free time (excluding work) do you usually use the computer, tablet, or mobile phone for leisure*”

*in activities such as using social networks, watching the news, videos, playing games, etc.*” Based on the answers, each one of two types of SB (SB TV and SB leisure) was dichotomized: 1)  $< 3$  h/day and  $\geq 3$  h/day <sup>2</sup>.

Obesity was analyzed using the body mass index (BMI), which was defined as the ratio between weight in kilograms and the square of height in meters <sup>42</sup>. Obesity was classified by using  $\text{BMI} > 27 \text{ kg/m}^2$  <sup>43,44</sup>, and electronic scales and portable stadiometers were utilized to measure the weight and height, respectively <sup>37</sup>. Then, SB TV and SB leisure were classified together with the presence of obesity as follows:

A) Typology 1: (1) without SB TV and without obesity; (2) SB TV; (3) obesity, and (4) SB TV + obesity.

B) Typology 2: (1) without SB leisure and without obesity; (2) SB leisure; (3) obesity, and (4) SB leisure + obesity.

#### DEPENDENT VARIABLES

The outcomes analyzed were disabilities in BADLs and IADLs considering the self-report of minor or major difficulty and/or inability to independently perform at least one of seven BADLs: eating; bathing, using the bathroom, dressing, walking from one room to another, getting up or laying down from bed, and sitting or getting up from a chair, and at least one of five IADLs: shopping, managing finances, taking medication, going to the doctor, and using means of transportation <sup>40</sup>.

#### ADJUSTMENT VARIABLES

The following adjustment variables were adopted: gender (male and female) <sup>45</sup>, age group (60–69, 70–79, and 80 years or over) <sup>46</sup>, educational level (no formal education, 1–4, 5–8, 9–11 years, and 12 years or more) <sup>38</sup>, marital status (married, divorced/single, and widowed) <sup>38,47</sup>, self-perceived health (very good, good, regular, poor, and very poor) <sup>48</sup>, the number of self-reported chronic diseases (0, 1, 2, or more) <sup>24</sup>, self-reported depressive symptoms (yes or no) <sup>38</sup>, and level of leisure-time physical activity (insufficiently active with less than 150 min/week of physical activity and sufficiently active with over 150 min/week of physical activity) <sup>42</sup>. To define leisure-time physical activity, self-reports of light/moderate physical activity (e.g., walking, weight training, and water gymnastics) and vigorous physical activity (e.g., running, soccer, basketball, tennis, and aerobics) were used; more information about the classification is described elsewhere <sup>2</sup>.

## DATA ANALYSIS

Statistical analyses were performed using the Stata software (version 14.0) (Stata Corp, USA). Descriptive analyses were performed for all variables, calculating the prevalence and respective 95% confidence intervals (CI 95%). To test the associations between independent and dependent variables, multivariable logistic regression analysis was used and considered statistically significant when  $p < 0.05$  was obtained from the estimate of the odds ratio (OR) unadjusted and adjusted and the respective CI 95%. All analyses considered the effect of study design, incorporating sample weights using the ‘svy’ command.

## **RESULTS**

Of the total sample of 43,554 older adults, 22,728 met the inclusion criteria, among which the majority were female (55.3%), married (44.3%), aged between 60 and 69 years (55.4%), with 1–4 years of formal education (61.1%), and with a per capita household income of less than one minimum wage (41.3%). Most did not report depressive symptoms (79.3%), self-perceived their health as very good/good (46.9%), were insufficiently active (80.6%), and over half of the sample had two or more chronic diseases (50.5%) (Table 1).

Regarding the outcomes, the prevalence of disability in BADL was 19.9% (95% CI: 19.3; 20.5), while for IADL, it was 31.8% (95% CI: 31.2; 32.5). Regarding the exposures analyzed, we found that 41.5% (95% CI: 40.8; 42.2) of the participants were obese, 28.8% (95% CI: 28.2; 29.5) had SB TV, and 5.2% (95% CI: 4.8; 5.5) had SB leisure. In the joint typologies of SB TV + obesity and SB leisure + obesity, there was a prevalence of 13.2% (95% CI: 12.7; 13.7) and 2.6% (95% CI: 2.4; 2.9), respectively.

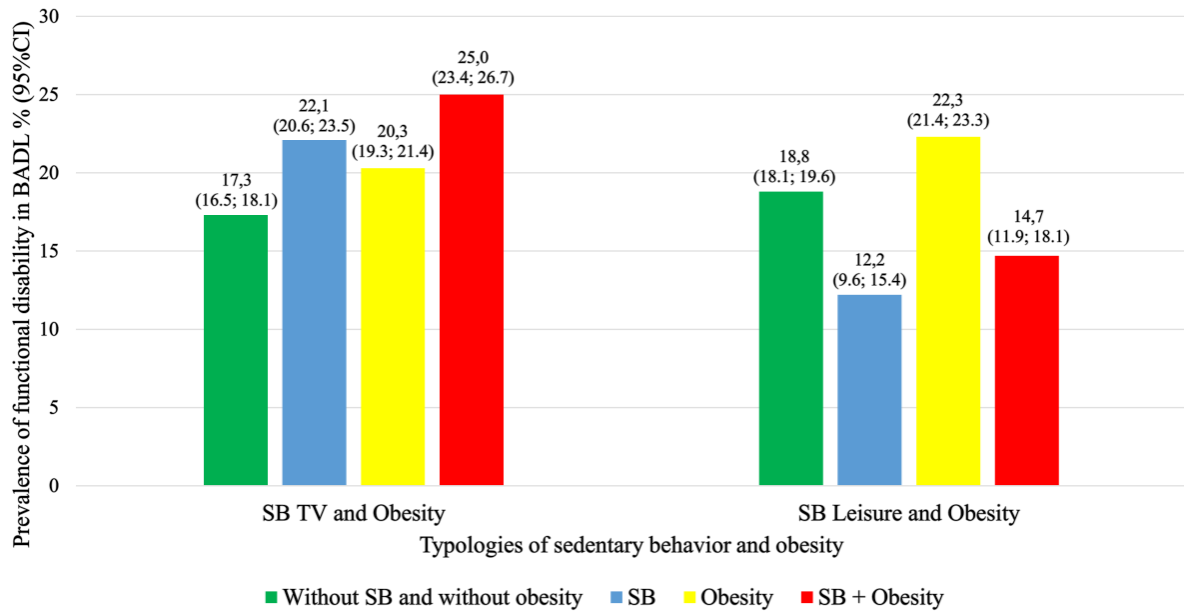
Figures 1 and 2 illustrate the prevalence of disabilities in BADL and IADL according to the types of SB and obesity. Regarding disabilities in BADL, prevalences of SB TV + obesity and SB leisure + obesity were 25% (95% CI: 23.4; 26.7) and 14.7% (95% CI: 11.9; 18.1), respectively. As far as IADL is concerned, prevalences of SB TV + obesity and SB leisure + obesity were 34.9% (95% CI: 33.1; 36.7) and 19.1 (95% CI: 15.8; 23.0), respectively.



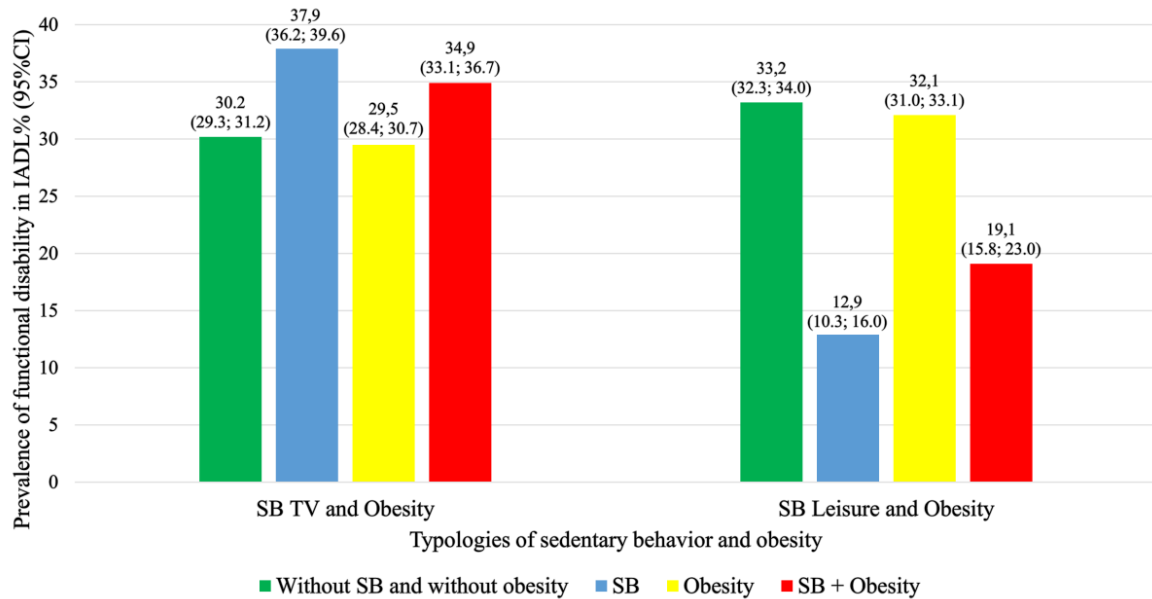
**Table 1.** Description of sociodemographic, behavioral, and health condition variables according to the total sample and for disabilities in basic (BADL) and instrumental (IADL) activities of daily living in older adults. National Health Survey, Brazil, 2019.

Variables	Total	Functional disability in BADL	Functional disability in IADL
	% (95% CI)	% (95% CI)	% (95% CI)
<b>Gender [n = 22,728]</b>			
Male	44.6 (43.9; 45.3)	16.6 (15.8; 17.4)	24.7 (23.8; 25.6)
Female	55.3 (54.6; 56.0)	22.6 (21.8; 23.3)	37.6 (36.7; 38.5)
<b>Age range (years) [n = 22,728]</b>			
60–69	55.4 (54.7; 56.1)	14.1 (13.4; 14.7)	20.2 (19.4; 20.9)
70–79	31.3 (30.7; 32.0)	21.9 (20.9; 22.9)	37.8 (36.6; 39.0)
≥ 80	13.1 (12.6; 13.6)	39.8 (38.0; 41.6)	66.8 (65.0; 68.6)
<b>Years of formal education [n = 21,869]</b>			
No education	21.9 (21.3; 22.6)	28.2 (27.0; 29.5)	51.7 (50.2; 53.2)
1–4	37.4 (36.7; 38.2)	21.6 (20.6; 22.5)	35.3 (34.2; 36.4)
5–8	12.8 (12.3; 13.3)	18.6 (17.0; 20.2)	24.9 (23.2; 26.6)
9–11	16.9 (16.3; 17.4)	14.1 (13.0; 15.4)	19.5 (18.2; 20.9)
≥12	10.7 (10.2; 11.2)	10.9 (9.6; 12.4)	13.2 (11.8; 14.8)
<b>Per capita household income (minimum wage) [n = 22,725]</b>			
< 1	41.3 (40.5; 42.0)	24.0 (23.1; 24.9)	40.3 (39.3; 41.4)
≥ 1 and < 2	30.1 (29.4; 30.8)	19.7 (18.7; 20.8)	31.1 (29.9; 32.3)
≥ 2	28.5 (27.8; 29.3)	14.1 (13.2; 15.1)	20.4 (19.3; 21.5)
<b>Marital status [n = 22,728]</b>			
Married	44.3 (43.5; 45.0)	17.1 (16.3; 17.9)	26.6 (25.6; 27.5)
Divorced/single	28.7 (28.1; 29.3)	18.3 (17.3; 19.3)	26.8 (25.7; 27.9)
Widower	26.9 (26.3; 27.5)	26.3 (25.1; 27.5)	45.9 (44.5; 47.3)
<b>Depressive symptoms [n = 22,728]</b>			
No	90.0 (89.5; 90.4)	16.8 (16.2; 17.4)	28.4 (27.7; 29.0)
Yes	9.9 (9.5; 10.4)	48.0 (45.8; 50.2)	63.2 (61.1; 65.3)
<b>Self-rated health [n = 22,728]</b>			
Very good/good	46.9 (46.2; 47.6)	9.1 (8.5; 9.7)	17.1 (16.3; 17.9)
Regular	41.8 (41.1; 42.5)	23.3 (22.4; 24.3)	38.9 (37.8; 39.9)
Bad/very bad	11.2 (10.8; 11.6)	52.4 (50.4; 54.4)	67.5 (65.6; 69.3)
<b>Physical activity at leisure [n = 22,585]</b>			
Insufficiently active	80.6 (80.0; 81.2)	22.6 (22.0; 23.3)	36.0 (35.3; 36.8)
Sufficiently active	19.3 (18.7; 19.9)	8.8 (7.9; 9.8)	14.8 (13.7; 15.9)
<b>Number of chronic diseases [n = 21,725]</b>			
0	19.9 (19.3; 20.4)	10.5 (9.6; 11.5)	19.0 (17.8; 20.3)
1	29.5 (28.8; 30.2)	14.5 (13.6; 15.4)	26.3 (25.1; 27.4)
≥2	50.5 (49.8; 51.2)	26.9 (26.0; 27.9)	40.5 (39.5; 41.5)
<b>N total (not weighted)</b>		<b>22,728</b>	

\* 95% CI: 95% confidence interval; leisure-time PA: level of leisure-time physical activity.



**Figure 1.** Prevalence of disabilities in basic activities of daily living (BADL) according to types of sedentary behavior (SB) and the presence of obesity in older adults. National Health Survey, Brazil, 2019.



**Figure 2.** Prevalence of disabilities in instrumental activities of daily living (IADL) according to types of sedentary behavior (SB) and the presence of obesity in older adults. National Health Survey, Brazil, 2019.

The results of the multivariable logistic regression between SB TV and SB leisure and obesity with disabilities in BADL and IADL are listed in Table 2. Considering the adjusted analyses, the older adults with only SB TV, only obese, and SB TV + obesity showed 21%

(OR:1.21; 95% CI: 1.07; 1.36), 26% (OR: 1.26; 95% CI: 1.14; 1.39), and 55% (OR: 1.55; 95% CI: 1.37; 1.75) greater odds of disabilities in BADL, respectively, compared to those without SB TV and without obesity. The odds of disabilities in the IADL were significantly higher for the older adults with SB TV (OR: 1.38; 95%CI: 1.24; 1.54) and SB TV + obesity (OR: 1.25; 95% CI: 1.12; 1.40) compared to those without SB TV and without obesity.

Regarding SB leisure, obese older adults were 28% (OR: 1.28; 95% CI: 1.18; 1.39) more likely to be unable to perform BADL compared to those without SB leisure and without obesity. Nevertheless, the participants with SB leisure were 44% (OR: 0.56; 95%CI: 0.41; 0.76) less likely to have disabilities in IADL compared to those without SB leisure and without obesity (Table 2).

**Table 2.** Unadjusted and adjusted analyses of multivariate logistic regression between sedentary behavior (SB) with and without obesity and disabilities in basic (BADL) and instrumental (IADL) activities of daily living in the elderly. National Health Survey, Brazil, 2019.

Sedentary behavior and obesity	BADL disabilities		IADL disabilities	
	Unadjusted OR (95% CI)	Adjusted* OR (95% CI)	Unadjusted OR (95% CI)	Adjusted* OR (95% CI)
<b>Typology 1</b>				
No SB TV and no obesity	Ref.	Ref.	Ref.	Ref.
SB TV	<b>1.35 (1.22; 1.49)</b>	<b>1.21 (1.07; 1.36)</b>	<b>1.40 (1.29; 1.52)</b>	<b>1.38 (1.24; 1.54)</b>
Obesity	<b>1.22 (1.12; 1.32)</b>	<b>1.26 (1.14; 1.39)</b>	0.96 (0.89; 1.03)	1.02 (0.93; 1.11)
SB TV + Obesity	<b>1.59 (1.43; 1.77)</b>	<b>1.55 (1.37; 1.75)</b>	<b>1.23 (1.12; 1.35)</b>	<b>1.25 (1.12; 1.40)</b>
<b>Typology 2</b>				
No SB leisure and no obesity	Ref.	Ref.	Ref.	Ref.
SB leisure	<b>0.58 (0.45; 0.78)</b>	1.01 (0.74; 1.40)	<b>0.29 (0.23; 0.38)</b>	<b>0.56 (0.41; 0.76)</b>
Obesity	<b>1.23 (1.15; 1.32)</b>	<b>1.28 (1.18; 1.39)</b>	0.95 (0.89; 1.01)	0.98 (0.91; 1.06)
SB leisure + obesity	<b>0.74 (0.57; 0.95)</b>	1.12 (0.84; 1.50)	<b>0.47 (0.38; 0.59)</b>	0.88 (0.67; 1.15)

\* = Adjusted for gender, age group, years of formal education, per capita household income regarding minimum wages, marital status, depressive symptoms, self-rated health, number of chronic diseases, and level of leisure time physical activity.

In bold = statistically significant association.

OR: odds ratio; 95% CI: 95% confidence interval; SB: sedentary behavior; TV: television

## DISCUSSION

The main results indicated that SB TV, with or without obesity, was associated with higher odds of disabilities, both in BADL and IADL. However, isolated SB leisure (without obesity) was associated with lower odds of disabilities in IADL.

Obesity was associated with disabilities in BADL when analyzed in both types, alone and with SB TV. This finding is consistent with other evidence pointing to the relationship between obesity and disability in BADL in the older adults<sup>26,49</sup>. This effect is probably due to the nature of BADL, which depends more intrinsically on the individual's ability to move and lift their weight than IADL<sup>50</sup>. In obesity, high body mass and its consequent osteoarticular disorders lead to greater difficulties in performing movements included in the BADL spectrum, such as sitting/standing up from a chair and walking from one room to another<sup>26</sup>. The relationship between obesity and impaired mobility has already been presented by Ramírez-Vélez et al. (2019), who analyzed data from 20,507 Colombian community-dwelling older adults and concluded that obesity is associated with decreased walking speed and, consequently, disabilities in BADL<sup>51</sup>. In addition, obesity is known to be a chronic inflammatory state associated with the development of various morbidities<sup>52</sup>, which, similarly to what occurs with SB TV, lead to disabilities<sup>24</sup>.

The greater odds of disabilities in BADL were found among obese older adults who spent more time on SB TV, and the presence of obesity increased the magnitude of this association compared with non-obese who spent the same time on SB TV. The greater impairment of BADL in older adults with obesity can be explained by the previously described association between obesity and disabilities in BADL<sup>49,51,53</sup>. The relationship between disabilities in BADL and SB TV can be explained mainly by the cognitive impairment associated with watching television for long periods<sup>54</sup>. Like other passive sedentary activities, watching television stimulates social isolation, leading to the decline of executive functions essential for daily living activities<sup>54,55</sup>. To a certain degree, the decrease in cognitive ability may be detrimental to the performance of certain IADL (e.g., shopping and managing finances) and, in more advanced degrees, BADL (e.g., eating and bathing)<sup>56</sup>. In addition to cognitive decline, SB in passive contexts, including watching television, is linked to increased risks of cardiovascular disease, type 2 diabetes mellitus, and other negative health outcomes<sup>2,57,58</sup>. Depending on the severity level, the symptoms of such morbidities can limit the performance of activities requiring greater physical effort, consequently leading to functional disability in BADL and IADL<sup>24</sup>.

SB leisure reduced the odds of disabilities in IADL. This can be explained by the time spent in SB using devices such as tablets and/or computers, usually involving more active cognitive activities than watching television, requiring concentration and reading<sup>56</sup>. In addition, unlike the habit of watching television, SB leisure subsidizes interpersonal interaction, which prevents the deterioration of the mental health of the older people<sup>54</sup>. Moreover, evidence has shown that the older adults who perform SB leisure are more likely to perform physical activities<sup>34</sup>. A study with 1580 Japanese older adults associated SB TV with less physical activity with moderate to vigorous intensity, while more intellectually active practices such as reading, using the computer and the internet were associated with greater physical activity of the same intensity<sup>34</sup>. Moderate to vigorous physical activity is shown to be a protective factor for the development of disabilities by improving physical and mental conditioning<sup>59</sup>. It is possible that due to the greater cognitive exercise required and its apparent association with physical activity, SB leisure can be considered a possible protective factor for IADL.

It is worth noting that none of the analyses indicated that isolated obesity was associated with greater probabilities of disability in IADL. In the literature, the relationship between obesity and type of disability is still inconsistent<sup>32,60</sup>. While some studies have only found a relationship between obesity and disabilities in BADL or only in IADL, others have pointed to obesity as a risk factor for both; nevertheless, the relationship between obesity and disability in BADL appears more frequently<sup>49,53,61</sup>. These differences can be explained by sampling and methodological differences between studies, such as the tools used to measure obesity (e.g., BMI or waist circumference) and the cross-sectional or longitudinal design<sup>62</sup>. A longitudinal study analyzed 1040 older adults Brazilians using waist circumference to measure obesity and found an association between abdominal obesity and disability in IADL, although BADL was not investigated<sup>62</sup>. It is clear, therefore, that the association between obesity and disabilities deserves further investigation, preferably via standardized analysis methods.

Despite the pertinent findings of this study, it is important to emphasize a considerable limitation, which was the use of self-reported and under or overestimation of the inquired measures<sup>63</sup>. Furthermore, the cross-sectional design does not necessarily claim causality between the dependent and independent variables investigated<sup>42</sup>. Still, some of the findings are difficult to compare with the literature due to the lack of standardization of the analyzed variables — SB typologies<sup>22</sup>, obesity measurements<sup>43</sup>, and tools of disabilities evaluation<sup>50</sup> — which may alter the final results of each study. As a strong point, it is worth highlighting the originality of our study, which explores the gap in the literature on the relationship between

different types of SB, obesity, and disabilities, in addition to the national coverage of the sample.

Ideally, excessive time in SB and obesity should be fought, avoiding the performance of low energy expenditure practices for long consecutive periods as much as possible. However, this study demonstrated that more than 3 h a day of SB TV could contribute to the presence of disabilities; hence, it is preferable for the time in SB to be spent with more cognitively stimulating activities such as reading, games, and interpersonal interaction, to the detriment of the habit of watching television. Such substitution of the SB typology benefits the functionality of the older population<sup>54</sup> Furthermore, the fight against obesity can prevent disability among the older adults, in addition to the various other negative outcomes already described in the literature. Lastly, future studies should seek to investigate the association between SB and disabilities and take into account the different typologies of both variables since the results may differ according to the selected categories.

## CONCLUSIONS

Different associations between SB typologies and the presence of disabilities were observed in the analyzed community-dwelling older adults, although such associations differed according to the evaluated exposures. Additionally, SB TV, with or without obesity, increased the likelihood of disabilities in BADL and IADL, whereas SB leisure decreased the odds of disability in IADL. Obesity, which was analyzed in isolation, was positively associated with the presence of a disability only in BADL.

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## **CONCLUSÃO E CONSIDERAÇÕES FINAIS**

Houve diferentes associações entre as tipologias de CS e a presença de incapacidade nos idosos comunitários analisados, todavia tais associações diferiram conforme as exposições avaliadas. O CS TV, na presença ou não de obesidade, elevou as chances de incapacidade nas ABVD e AIVD, enquanto que o CS lazer diminuiu as chances de incapacidade nas AIVD. Já a obesidade analisada isoladamente mostrou-se positivamente associada à presença de incapacidade somente nas ABVD.

## ANEXO

### REGRAS DE SUBMISSÃO

#### **Forma e preparação de manuscritos**

Cadernos de Saúde Pública/Reports in Public Health (CSP) publica artigos originais com elevado mérito científico que contribuem com o estudo da saúde pública em geral e disciplinas afins. Desde janeiro de 2016, a revista adota apenas a versão on-line, em sistema de publicação continuada de artigos em periódicos indexados na base SciELO.

Recomendamos aos autores a leitura atenta das instruções antes de submeterem seus artigos a CSP.

Como o resumo do artigo alcança maior visibilidade e distribuição do que o artigo em si, indicamos a leitura atenta da recomendação específica para sua elaboração

#### **1. CSP aceita trabalhos para as seguintes seções:**

- 1.1. Perspectivas: análises de temas conjunturais, de interesse imediato, de importância para a Saúde Coletiva (máximo de 2.200 palavras);
- 1.2. Debate: análise de temas relevantes do campo da Saúde Coletiva, que é acompanhado por comentários críticos assinados por autores a convite das Editoras, seguida de resposta do autor do artigo principal (máximo de 6.000 palavras e 5 ilustrações);
- 1.3. Espaço Temático: seção destinada à publicação de 3 a 4 artigos versando sobre tema comum, relevante para a Saúde Coletiva. Os interessados em submeter trabalhos para essa Seção devem consultar as Editoras;
- 1.4. Revisão: revisão crítica da literatura sobre temas pertinentes à Saúde Coletiva, máximo de 8.000 palavras e 5 ilustrações. Toda revisão sistemática deverá ter seu protocolo publicado ou registrado em uma base de registro de revisões sistemáticas como por exemplo o PROSPERO; as revisões sistemáticas deverão ser submetidas em inglês;
- 1.5. Ensaio: texto original que desenvolve um argumento sobre temática bem delimitada, podendo ter até 8.000 palavras;
- 1.6. Questões Metodológicas: artigos cujo foco é a discussão, comparação ou avaliação de aspectos metodológicos importantes para o campo, seja na área de desenho de estudos, análise de dados ou métodos qualitativos (máximo de 6.000 palavras e 5 ilustrações); artigos sobre instrumentos de aferição epidemiológicos devem ser submetidos para esta Seção, obedecendo



preferencialmente as regras de Comunicação Breve (máximo de 2.200 palavras e 3 ilustrações);

1.7. Artigo: resultado de pesquisa de natureza empírica (máximo de 6.000 palavras e 5 ilustrações). Dentro dos diversos tipos de estudos empíricos, apresentamos dois exemplos: artigo de pesquisa etiológica na epidemiologia e artigo utilizando metodologia qualitativa;

1.8. Comunicação Breve: relatando resultados preliminares de pesquisa, ou ainda resultados de estudos originais que possam ser apresentados de forma sucinta (máximo de 2.200 palavras e 3 ilustrações);

1.9. Cartas: comentário a artigo publicado em fascículo anterior de CSP (máximo de 1.400 palavras);

1.10. Resenhas: Análise crítica de livro relacionado ao campo temático de CSP, publicado nos últimos dois anos (máximo de 1.400 palavras). As resenhas devem conter título e referências bibliográficas. A resenha contempla uma análise da obra no conjunto de um campo em que a mesma está situada, não se restringe a uma apresentação de seu conteúdo, quando obra única, ou de seus capítulos, quando uma obra organizada. O esforço é contribuir com a análise de limites e contribuições, por isto podem ser necessários acionamentos a autores e cenários políticos para produzir a análise, a crítica e a apresentação da obra. O foco em seus principais conceitos, categorias e análises pode ser um caminho desejável para a contribuição da resenha como uma análise crítica.

Obs: A política editorial de CSP é apresentada por meio dos editoriais. Recomendamos fortemente a leitura dos seguintes textos:

## **2. Normas para envio de artigos**

2.1. CSP publica somente artigos inéditos e originais, e que não estejam em avaliação em nenhum outro periódico simultaneamente. Os autores devem declarar essas condições no processo de submissão. Caso seja identificada a publicação ou submissão simultânea em outro periódico o artigo será desconsiderado. A submissão simultânea de um artigo científico a mais de um periódico constitui grave falta de ética do autor.

2.2. Não há taxas para submissão e avaliação de artigos.

2.3. Serão aceitas contribuições em Português, Inglês ou Espanhol.

2.4. Notas de rodapé, de fim de página e anexos não serão aceitos.

2.5. A contagem de palavras inclui somente o corpo do texto e as referências bibliográficas, conforme item 2.12.

2.6. Todos os autores dos artigos aceitos para publicação serão automaticamente inseridos no

banco de consultores de CSP, se comprometendo, portanto, a ficar à disposição para avaliarem artigos submetidos nos temas referentes ao artigo publicado.

2.7. Serão aceitos artigos depositados em servidor de *preprint*, previamente à submissão a CSP ou durante o processo de avaliação por pares. É necessário que o autor informe o nome do servidor e o DOI atribuído ao artigo por meio de formulário específico (contatar [cadernos@fiocruz.br](mailto:cadernos@fiocruz.br)). NÃO recomendamos a publicação em servidor de *preprint* de artigo já aprovado.

### **3. Publicação de ensaios clínicos**

3.1. Artigos que apresentem resultados parciais ou integrais de ensaios clínicos devem obrigatoriamente ser acompanhados do número e entidade de registro do ensaio clínico.

3.2. Essa exigência está de acordo com a recomendação do Centro Latino-Americano e do Caribe de Informação em Ciências da Saúde (BIREME)/Organização Pan-Americana da Saúde (OPAS)/Organização Mundial da Saúde (OMS) sobre o Registro de Ensaios Clínicos a serem publicados a partir de orientações da OMS, do International Committee of Medical Journal Editors (ICMJE) e do Workshop ICTPR.

3.3. As entidades que registram ensaios clínicos segundo os critérios do ICMJE são:

[Australian New Zealand Clinical Trials Registry \(ANZCTR\)](#)

[ClinicalTrials.gov](#)

[International Standard Randomised Controlled Trial Number \(ISRCTN\)](#)

[Netherlands Trial Register \(NTR\)](#)

[UMIN Clinical Trials Registry \(UMIN-CTR\)](#)

[WHO International Clinical Trials Registry Platform \(ICTRP\)](#)

### **4. Fontes de financiamento**

4.1. Os autores devem declarar todas as fontes de financiamento ou suporte, institucional ou privado, para a realização do estudo.

4.2. Fornecedores de materiais ou equipamentos, gratuitos ou com descontos, também devem ser descritos como fontes de financiamento, incluindo a origem (cidade, estado e país).

4.3. No caso de estudos realizados sem recursos financeiros institucionais e/ou privados, os autores devem declarar que a pesquisa não recebeu financiamento para a sua realização.

### **5. Conflito de interesses**

5.1. Os autores devem informar qualquer potencial conflito de interesse, incluindo interesses

políticos e/ou financeiros associados a patentes ou propriedade, provisão de materiais e/ou insumos e equipamentos utilizados no estudo pelos fabricantes.

## **6. Colaboradores**

6.1. Devem ser especificadas quais foram as contribuições individuais de cada autor na elaboração do artigo.

6.2. Lembramos que os critérios de autoria devem basear-se nas deliberações do ICMJE, que determina o seguinte: o reconhecimento da autoria deve estar baseado em contribuição substancial relacionada aos seguintes aspectos: 1. Concepção e projeto ou análise e interpretação dos dados; 2. Redação do artigo ou revisão crítica relevante do conteúdo intelectual; 3. Aprovação final da versão a ser publicada. 4. Ser responsável por todos os aspectos do trabalho na garantia da exatidão e integridade de qualquer parte da obra. Essas quatro condições devem ser integralmente atendidas.

6.3. Todos os autores deverão informar o número de registro do ORCID no cadastro de autoria do artigo. Não serão aceitos autores sem registro.

6.4. Os autores mantêm o direito autoral da obra, concedendo à publicação CSP o direito de primeira publicação, conforme a Licença Creative Commons do tipo atribuição BY (CC-BY).

6.5. Recomendamos a leitura do Editorial 34(11) que aborda as normas e políticas quanto à autoria de artigos científicos em CSP.

## **7. Agradecimentos**

7.1. Possíveis menções em agradecimentos incluem instituições que de alguma forma possibilitaram a realização da pesquisa e/ou pessoas que colaboraram com o estudo, mas que não preencheram os critérios de coautoria.

## **8. Referências**

8.1. As referências devem ser numeradas de forma consecutiva de acordo com a ordem em que forem sendo citadas no texto. Devem ser identificadas por números arábicos sobrescritos (p. ex.: Silva <sup>1</sup>). As referências citadas somente em tabelas e figuras devem ser numeradas a partir do número da última referência citada no texto. As referências citadas deverão ser listadas ao final do artigo, em ordem numérica, seguindo as normas gerais dos Requisitos Uniformes para Manuscritos Apresentados a Periódicos Biomédicos. Não serão aceitas as referências em nota de rodapé ou fim de página

8.2. Todas as referências devem ser apresentadas de modo correto e completo. A veracidade

das informações contidas na lista de referências é de responsabilidade do(s) autor(es).

8.3. No caso de usar algum software de gerenciamento de referências bibliográficas (p. ex.: EndNote), o(s) autor(es) deverá(ão) converter as referências para texto.

## **9. Nomenclatura**

9.1. Devem ser observadas as regras de nomenclatura zoológica e botânica, assim como abreviaturas e convenções adotadas em disciplinas especializadas.

## **10. Ética em pesquisas envolvendo seres humanos**

10.1. A publicação de artigos que trazem resultados de pesquisas envolvendo seres humanos está condicionada ao cumprimento dos princípios éticos contidos na Declaração de Helsinki (1964, reformulada em 1975, 1983, 1989, 1996, 2000 e 2008), da Associação Médica Mundial.

10.2. Além disso, deve ser observado o atendimento a legislações específicas (quando houver) do país no qual a pesquisa foi realizada, informando protocolo de aprovação em Comitê de Ética quando pertinente. Essa informação deverá constituir o último parágrafo da seção Métodos do artigo.

10.3. Artigos que apresentem resultados de pesquisas envolvendo seres humanos deverão conter uma clara afirmação deste cumprimento (tal afirmação deverá constituir o último parágrafo da seção Métodos do artigo).

10.4. CSP é filiado ao COPE (Committee on Publication Ethics) e adota os preceitos de integridade em pesquisa recomendados por esta organização. Informações adicionais sobre integridade em pesquisa.

10.5. O Conselho Editorial de CSP se reserva o direito de solicitar informações adicionais sobre os procedimentos éticos executados na pesquisa.