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Exposure to simultaneous sedentary behavior domains and sociodemographic factors associated in public servants

Exposição a simultâneos domínios do comportamento sedentário e fatores sociodemográficos associados em servidores públicos

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Abstract - Exposure to sedentary behavior may contribute to health problems. This study aimed to estimate the prevalence of exposure to simultaneous sedentary behavior domains and verify associated sociodemographic characteristics among technical and administrative servers of a Brazilian university. This is a cross-sectional epidemiological study carried out with 623 technical and administrative servers. Sedentary behavior was identified through a questionnaire in the following domains: commuting (active / passive), sitting time at work, daily time spent watching television and computer use (≥3 hours / day). Sociodemographic variables were age, sex and educational level. The prevalence of servers that had one, two, three and four simultaneous sedentary behavior was 28.4%, 43.2%, 22.5% and 4.3%, respectively. Women were more likely to have three sedentary behavior simultaneously (OR = 1.61, CI 95% = 1.02, 2.56). Servers with 9-11 years of schooling were less exposed to two (OR = 0.27, CI 95% = 0.17, 0.44), three (OR = 0.39, CI 95% = 0.23, 0.66) and four (OR = 0.22, CI 95% = 0.07; 0.69) sedentary behavior simultaneously and those over 12 years of schooling were less likely of having two (OR = 0.22, CI 95% = 0.10; 0.49) and three (OR = 0.15, CI 95% = 0.05, 0.46) sedentary behavior simultaneously. More than half of servers have two sedentary behavior during the week. Having sedentary behavior in more than one domain simultaneously was associated with sex and educational level.

Key words: Age groups; Educational status; Occupational health; Sedentary lifestyle.

Resumo - *A exposição a comportamentos sedentários podem contribuir para diversos agravos a saúde. Este estudo teve como objetivo estimar a prevalência de exposição a simultâneos domínios do comportamento sedentário e verificar que características sociodemográficas estão associadas, em servidores técnico-administrativos de uma universidade federal brasileira. Trata-se de um estudo epidemiológico transversal realizado com 623 servidores técnico-administrativos. O comportamento sedentário foi identificado por meio de questionário nos domínios: deslocamento (ativo/passivo), tempo sentado no trabalho, tempo de assistir televisão e utilização o computador por dia (≥ três horas/dia). As variáveis sociodemográficas investigadas foram: idade, sexo e escolaridade. A prevalência de servidores que apresentaram um, dois, três e quatro comportamentos sedentários simultaneamente foi de 28,4%, 43,2%, 22,5% e 4,3%, respectivamente. As mulheres apresentaram maior chance de ter três comportamentos sedentários simultaneamente (RC: 1,61; IC95%: 1,02; 2,56). Os servidores com 9 a 11 anos de escolaridade estiveram menos expostos a dois (RC: 0,27; IC95%: 0,17; 0,44), três (RC: 0,39; IC95%: 0,23; 0,66) e quatro (RC: 0,22; IC95%: 0,07; 0,69) comportamentos sedentários simultaneamente e aqueles com 12 anos ou mais de escolaridade tiveram menor chance de ter dois (RC: 0,22; IC95%: 0,10; 0,49) e três (RC: 0,15; IC95%: 0,05; 0,46) comportamentos sedentários. Mais da metade dos servidores apresentaram comportamentos sedentários em dois domínios, durante a semana. O comportamento sedentário em mais de um domínio simultaneamente foi associado ao sexo e ao nível educacional.*

Palavras-chave: *Escolaridade, Estilo de vida sedentário, Grupos etários, Saúde do trabalhador.*

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INTRODUCTION

Lifestyle, especially in developed countries, is often associated with sedentary behavior[1], defined as any wakeful behavior characterized by energy expenditure equal to or less than 1.5 metabolic equivalents (METs), whether sitting, reclining or lying down. In addition, it is considered with respect to the time spent in this behavior (example: minutes, hours) and in the different contexts (displacement, school, work) in which this behavior can occur[2-3]

Estimates reveal that individuals can spend 50-60% of their daily time in low-energy expenditure activities. The justification for these values is that the opportunities for the sedentary behavior repetition are numerous: watching TV, using the computer, sitting in the car, among others[1]. Researchers point out that this trend spread throughout the world is explained by changes in transport systems, modes of industrial production, innovations in national communications in workplaces and labor technologies and other aspects of the built environment of cities, leading people to apply less and less energy to perform everyday tasks[4].

Sedentary behavior has caused various health hazards and the time spent in this type of behavior seems to be a global tendency [5-8]. Studies have indicated that for every two daily hours of television watching, the chance of having some cardiovascular disease increases by 15%. Similar exposure is also observed for other comorbidities, in which the adoption of sedentary behaviors in much of the time increases by 112% the risk of developing diabetes or 72% the chance of having metabolic syndrome[1].

In this context, in addition to well-known health-related aspects, sociodemographic characteristics could also could be important determinants in the sedentary behavior[9]. In Australia, adults with paid work spend most of their time sitting and working with computer and driving compared to those who do not have paid work[10]. In the Portuguese population, the time spent in sedentary activities decreases as the educational level decreases[1]. In Brazil, a research developed in the southern region illustrates that man, younger adults with higher educational level and high socioeconomic status spend more time on sedentary behaviors[11]. In university labor context, a research conducted in a Brazilian university has shown that technical and administrative servers were more physically active in occupational activities and mobility when compared to teachers [12].

Studies have shown association between sociodemographic factors and sedentary behaviors in isolation; however, sedentary behavior can be adopted throughout the day in different domains and little is known about the simultaneity of these behaviors and this relationship. In this sense, the present study aimed to estimate the prevalence of simultaneous exposure to domains of sedentary behavior and verify which sociodemographic characteristics are associated in technical and administrative servers of a Brazilian university.

METHODOLOGICAL PROCEDURES

This is an epidemiological cross-sectional study conducted in 2012 in Florianópolis, SC, Brazil. The present paper was developed using data from the "Lifestyle, physical activity, body image perception and health risk factors of technical and administrative servers at the Federal University of Santa Catarina" research. Further details about the study are in previous publication[13].

The target population of this study was composed of technical and administrative servers of both sexes working at UFSC, totaling 3,008 people (171 auxiliary-level, 1,823 intermediate-level and 999 higher-level servers), according to data from the Pro-Rectory of Human and Social Development, in 2012.

The sample size calculation was based on the unknown prevalence for the outcome equal to 50%, with sampling error of 3.5 percentage points and 95% confidence level, resulting in a sample size of 621 individuals. About 20% was added for possible losses and refusals, totaling a sample of 746 servers.

The sample selection was performed using the proportional method to ensure that auxiliary-level, intermediate-level and higher-level servers were selected. Thus, 43 auxiliary-level, 456 intermediate-level and 250 higher-level servers were randomly and systematically selected. Sample replacement was scheduled for servers who were removed, absent, assigned to other institutions, dismissed, resigned, retired and also those who could not be reached for lack of information about current workplace. In this sense, any individual who has been selected and was in one of these situations was replaced by another participant, which resulted in 54 replacements. All technical and administrative servers working at UFSC of both sexes were defined as eligible.

Sedentary behavior was investigated from issues related to the time that servers remain seated, considering leisure, labor and commuting domains. The questions used included commuting to work (walking, bicycle, motorcycle / bus or car), time watching television (TV) (hours / day during the week[14], computer usage time during the week (hours / day, excluding at work) and sitting time at work (hours / day). The classification of sedentary behavior commuting to work was grouped into active (walking or cycling) or little active (car, motorcycle or bus). For TV time, computer time and sitting time at work, cutoff of three hours per day or more was considered sedentary behavior.

Sociodemographic characteristics were collected through a questionnaire with information regarding age, sex and educational level. Age was obtained from information on assessment date and birth date, being grouped into age groups 20-29 years, 30-39 years, 40-49 years, 50-59 years and 60-69 years. To identify the educational level, the following options were considered: incomplete basic education, complete basic education, incomplete high-school, complete high-school, incomplete higher educa-

tion, complete higher education. Data were categorized into: ≤ 8 years (incomplete or complete basic education); 9-11 years (incomplete or complete high-school) and ≥ 12 years (incomplete or complete higher education).

In the descriptive analysis, absolute (n) and relative frequency values (%) were calculated. The proportion of servers who presented sedentary behavior (outcome) in relation to the total number of servers investigated was reported as prevalence, although the outcomes of interest are not diseases.

The associations of sedentary behavior domains with sociodemographic variables were tested using the chi-square test and binary logistic regression. To determine the prevalence of exposure to simultaneous sedentary behaviors, the "simultaneity" variable was created based on the sum of exposure to sedentary behaviors, being categorized into: up to one, two, three and four sedentary behaviors. Six other variables related to possible combinations with two sedentary behaviors were also created: "Commuting (little active) + TV time / day"; " Commuting (little active) + Computer time / day"; " Commuting (little active) + Sitting time "; " TV time / day + Computer time / day"; " TV time / day + Sitting time"; "Computer time / day + Sitting time".

For the regression analyses of combinations, six binary logistic regressions were performed, estimating the odds ratio and respective confidence intervals (CI 95%), testing associations of combinations of behaviors with sociodemographic variables. The reference category adopted for the combinations was presenting up to one of two behaviors. In the analysis of the "simultaneity" variable, multinomial regression was performed, also estimating the odds ratios and CI 95%, with reference category presenting "up to one sedentary behavior". For all analyses, 5% significance level was adopted. Data were analyzed using the Statistical Package for the Social Sciences software (SPSS) version 15.0 for Windows.

The study was approved by the Ethics Committee of Research with Human Beings of the Federal University of Santa Catarina (UFSC), protocol No. 27939/13. Participants informed the consent to participate in the study by signing of the informed consent form.

RESULTS

The study included 623 technical and administrative servers of UFSC (83.5% of the estimated sample). During the data collection period, 16 servers did not participate in the survey for being on vacation, 16 for medical leave and 11 could not be contacted due to the lack of information on their workplace, and so 43 losses were obtained. In addition to these, 83 servers refused to participate. Losses and refusals did not differ between sex (male = 18.2%, female = 15.4%, p = 0.321) and occupational level (auxiliary level = 11.1%, intermediate level = 17.5%, and higher level = 16.9%; p = 0.551).

The sedentary behavior domains analyzed were associated with age and schooling. Higher proportion of servers little active in commuting to work who remain seated at work for three hours or more has been identi-

fied in the age group 50-59 years and with schooling higher than 12 years. Watching television for three hours or more is a frequent behavior in the age group 40-49 years and among those who have more than 12 years of schooling, and computer use for three hours or more was prevalent among servers with more than 12 years of schooling (Table 1).

Table 1. Sample distribution in relation to sociodemographic characteristics, according to sedentary behavior domains in technical and administrative servers. Florianópolis, SC, Brazil, in 2012.

Variables	n (%)	Commuting*		p value	Sitting time**		p value
		Active	Little active		< 3hours	≥ 3hours	
		n (%)	n (%)		n (%)	n (%)	
Age group (years)				<0.001			
20 to 29	68 (10.9)	20 (26.7)	48 (8.8)		59 (12.9)	8 (5.0)	
30 to 39	123 (19.7)	8 (10.7)	115 (21.1)		95 (20.7)	27 (16.9)	
40 to 49	172 (27.6)	17 (22.7)	155 (28.4)		122 (26.6)	49 (30.6)	
50 to 59	222 (35.6)	28 (37.3)	192 (35.2)		155 (33.8)	65 (40.6)	
60 to 69	38 (6.1)	2 (2.7)	36 (6.6)		27 (5.9)	11 (6.9)	
Sex				0.696			0.714
Female	338 (54.3)	39 (52.0)	297 (54.4)		251 (54.8)	85 (53.1)	
Male	285 (45.7)	36 (48.0)	249 (45.6)		207 (45.2)	75 (46.9)	
Education				0.007			0.011
≥ 12 years	436 (70.0)	51 (68.0)	385 (70.8)		336 (73.4)	96 (60.8)	
9 to 11 years	149 (23.9)	14 (18.7)	134 (24.6)		99 (21.6)	49 (31.0)	
≤ 8 years	36 (5.8)	10 (13.3)	25 (4.6)		23 (5.0)	13 (8.2)	
Variables	n (%)	TV time/day†		p value	Computer time/day†		p value
		< 3hours	≥ 3hours		< 3hours	≥ 3hours	
		n (%)	n (%)		n (%)	n (%)	
Age group (years)			0.039			0.084	
20 to 29	68 (10.9)	43 (8.9)	25 (17.7)	0.014	19 (8.4)	49 (12.7)	
30 to 39	123 (19.7)	96 (19.9)	27 (19.1)		38 (16.9)	83 (21.0)	
40 to 49	172 (27.6)	129 (26.8)	43 (30.5)		67 (29.8)	105 (26.5)	
50 to 59	222 (35.6)	181 (37.6)	41 (29.1)		81 (36.0)	141 (35.6)	
60 to 69	38 (6.1)	33 (6.8)	5 (3.5)		20 (8.9)	18 (4.5)	
Sex							0.086
Female	338 (54.3)	256 (53.1)	82 (58.2)	0.290	132 (58.7)	204 (51.5)	
Male	285 (45.7)	226 (46.9)	59 (41.8)		93 (41.3)	192 (48.5)	
Education							<0.001
≥ 12 years	436 (70.0)	318 (66.1)	118 (84.3)	<0.001	115 (51.3)	319 (80.8)	
9 to 11 years	149 (23.9)	129 (26.8)	20 (14.3)		85 (37.9)	64 (16.2)	
≤ 8 years	36 (5.8)	34 (7.1)	2 (1.4)		24 (10.7)	12 (3.0)	

* To work; ** At work; † TV and computer usage time per day during the week, without considering use of computer at work; Chi-square test. Values in bold: significant difference.

Servers in the age group 20-29 years were less likely to have little active commuting to work compared to servers aged 60-69 years. Those with 12 years of schooling or more were less likely to have little active commuting to work, using computer and remaining seated at work for three hours or more compared to those with eight years of schooling or less. Servers with 9-11 years of schooling were also less likely to show excessive computer

time and sitting time at work, but were more likely to watch television for three hours or more compared to those with eight years of schooling or less. Age was also associated with excessive TV time, computer use and sitting time at work for three hours or more in the crude analysis; however, in the adjusted analysis, this association was not verified (Table 2).

When the association of combination of sedentary behaviors with sociodemographic variables was analyzed, it was found that servers aged 20-29 years are less likely to have little active commuting to work and television time of three hours or more, compared to servers in the age group 60-69 years. Women were more likely to have little active commuting to work and sitting time at work for three hours or more simultaneously, as compared to men. Servers with 12 years of schooling or more and from nine to 11 years of schooling are less likely to have the following simultaneous sedentary behaviors: little active commuting and using the computer for three hours or more; little active commuting and sitting time at work for three hours or more and using the computer and sitting time at work for three hours or more (9-11 years) compared to servers with eight years of schooling or less (Table 3).

Table 2. Crude and adjusted prevalence ratio (PR) between sedentary behavior domains and sociodemographic characteristics of technical and administrative servers. Florianópolis, SC, Brazil, in 2012.

Variables	Commuting * (little active)		TV time/day** (≥ 3 hours)	
	Crude	Adjusted	Crude	Adjusted
	OR (CI 95%)	OR (CI 95%)	OR (CI 95%)	OR (CI 95%)
Age group (years)				
20 to 29	0.13 (0.03; 0.61)	0.08 (0.02; 0.40)	0.33 (0.12; 0.92)	0.40 (0.14; 1.14)
30 to 39	0.80 (0.16; 3.93)	0.49 (0.09; 2.59)	0.70 (0.31; 1.59)	0.82 (0.35; 1.93)
40 to 49	0.51 (0.11; 2.29)	0.33 (0.07; 1.59)	0.99 (0.45; 2.14)	1.02 (0.46; 2.26)
50 to 59	0.38 (0.09; 1.67)	0.29 (0.06; 1.31)	1.03 (0.48; 2.20)	1.04 (0.48; 2.25)
60 to 69	Reference	Reference	Reference	Reference
Sex				
Female	0.91 (0.56; 1.47)	0.97 (0.58; 1.63)	1.07 (0.75; 1.54)	0.97 (0.67; 1.41)
Male	Reference	Reference	Reference	Reference
Education				
≥ 12 years	0.33 (0.15; 0.73)	0.24 (0.10; 0.57)	1.98 (0.97; 4.05)	1.69 (0.80; 3.60)
9 to 11 years	1.27 (0.68; 2.36)	1.06 (0.55; 2.06)	1.73 (1.15; 2.61)	1.53 (1.00; 2.34)
≤ 8 years	Reference	Reference	Reference	Reference
Variables	Computer time/day† (≥ 3 hours)		Setting time† (≥ 3 hours)	
	Crude	Adjusted	Crude	Adjusted
	OR (CI 95%)	OR (CI 95%)	OR (CI 95%)	OR (CI 95%)
Age group (years)				
20 to 29	3.84 (1.33; 11.10)	2.65 (0.90; 7.88)	2.87 (1.25; 6.56)	1.80 (0.74; 4.41)
30 to 39	1.86 (0.61; 5.22)	1.32 (0.46; 3.80)	2.43 (1.15; 5.11)	1.63 (0.72; 3.67)
40 to 49	2.20 (0.81; 5.99)	1.82 (0.65; 5.06)	1.74 (0.86; 3.53)	1.52 (0.70; 3.28)
50 to 59	1.50 (0.55; 4.06)	1.43 (0.52; 3.96)	1.93(0.97; 3.87)	2.11(0.99; 4.50)
60 to 69	Reference	Reference	Reference	Reference

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Sex				
Female	0.82 (0.56; 1.19)	0.93 (0.63; 1.38)	1.34 (0.96; 1.86)	1.67 (1.16; 2.40)
Male	Reference	Reference	Reference	Reference
Education				
≥ 12 years	0.16 (0.04; 0.67)	0.19 (0.04; 0.82)	0.18 (0.09; 0.37)	0.15 (0.07; 0.32)
9 to 11 years	0.42 (0.25; 0.70)	0.44 (0.26; 0.76)	0.27 (0.18; 0.40)	0.25 (0.16; 0.38)
≤ 8 years	Reference	Reference	Reference	Reference

* To work; ** At work; † TV and computer usage time per day during the week, without considering use of computer at work; Chi-square test. Values in bold: significant difference.

Table 3. Adjusted odds ratio (OR) and confidence intervals among combinations of sedentary behavior domains and sociodemographic characteristics in technical and administrative servers. Florianópolis, SC, Brazil, in 2012.

Variables	Commuting (little active) + TV time/day	Commuting (little active) + Computer time/day	Commuting (little active) + Sitting time	TV time/day + Computer time/day	TV time/day + Sitting time	Computer time/day + Sitting time
	OR (CI 95%)	OR (CI 95%)	OR (CI 95%)	OR (CI 95%)	OR (CI 95%)	OR (CI 95%)
Age group (years)						
20 to 29	0.23 (0.07; 0.76)	1.64 (0.54; 4.99)	0.64 (0.27; 1.52)	0.26 (0.04; 1.64)	1.84 (0.35; 9.64)	2.39 (0.73; 7.85)
30 to 39	0.78 (0.33; 1.85)	1.08 (0.37; 3.16)	1.15 (0.52; 2.55)	0.75 (0.19; 2.97)	2.24 (0.46; 10.85)	1.31 (0.41; 4.18)
40 to 49	0.90 (0.40; 2.03)	1.55 (0.55; 4.33)	1.02 (0.48; 2.20)	0.58 (0.15; 2.25)	3.28 (0.73; 14.82)	1.58 (0.51; 4.89)
50 to 59	0.93 (0.42; 2.04)	1.27 (0.46; 3.53)	1.39 (0.66; 2.93)	0.59 (0.16; 2.21)	3.07 (0.69; 13.58)	1.46 (0.48; 4.45)
60 to 69	Reference	Reference	Reference	Reference	Reference	Reference
Sex						
Female	1.06 (0.72; 1.56)	0.93 (0.62; 1.41)	1.58 (1.12; 2.23)	0.96 (0.49; 1.90)	1.07 (0.66; 1.75)	1.07 (0.69; 1.65)
Male	Reference	Reference	Reference	Reference	Reference	Reference
Education						
≥ 12 years	0.89 (0.38; 2.10)	0.21 (0.05; 0.92)	0.14 (0.06; 0.32)	*	0.71 (0.20; 2.56)	0.25 (0.56; 1.07)
9 to 11 years	1.37 (0.88; 2.13)	0.43 (0.24; 0.76)	0.30 (0.20; 0.44)	0.77 (0.34; 1.78)	1.32 (0.76; 2.29)	0.41 (0.22; 0.76)
≤ 8 years	Reference	Reference	Reference	Reference	Reference	Reference

CI: confidence interval. * Impossible to estimate OR and CI 95% for having few individuals in the reference category; Values in bold: significant difference.

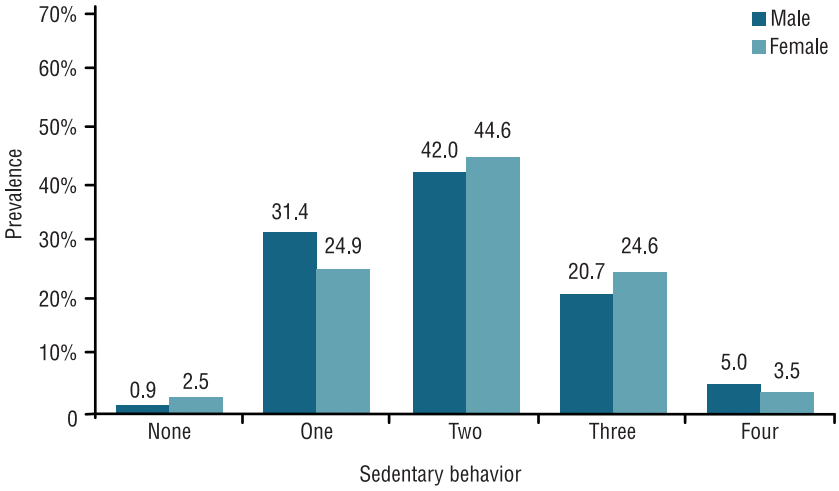

Figure 1. Exposure to simultaneous sedentary behaviors, in technical-administrative servers. Florianopolis, SC, Brazil, 2012.

Table 4. Crude and adjusted odds ratio (OR) among sedentary behavior domains and sociodemographic characteristics in technical and administrative servers. Florianópolis, SC, Brazil, in 2012.

Variables	2 behaviors		3 behaviors		4 behaviors	
	Crude	Adjusted	Crude	Adjusted	Crude	Adjusted
	OR (CI 95%)	OR (CI 95%)	OR (CI 95%)	OR (CI 95%)	OR (CI 95%)	OR (CI 95%)
Age group (years)						
20 to 29	1.17 (0.47; 2.91)	0.70 (0.27; 1.85)	1.85 (0.59; 5.75)	1.15 (0.35; 3.77)	0.33 (0.03; 3.92)	0.15 (0.01; 1.87)
30 to 39	1.88 (0.81; 4.32)	1.21 (0.49; 2.98)	1.88 (0.63; 5.55)	1.24 (0.40; 3.86)	1.64 (0.30; 8.86)	0.81 (0.14; 4.66)
40 to 49	1.44 (0.65; 3.21)	1.20 (0.51; 2.82)	2.10 (0.75; 5.89)	1.72 (0.59; 5.33)	1.20 (0.23; 6.27)	0.73 (0.13; 4.10)
50 to 59	1.42 (0.65; 3.10)	1.46 (0.64; 3.33)	1.90 (0.69; 5.25)	1.86 (0.65; 5.33)	1.01 (0.20; 5.15)	0.95 (0.18; 5.06)
60 to 69	Reference	Reference	Reference	Reference	Reference	Reference
Sex						
Female	1.25 (0.86; 1.82)	1.41 (0.95; 2.11)	1.40 (0.90; 2.17)	1.61 (1.02; 2.56)	0.82 (0.36; 1.89)	1.03 (0.43; 2.44)
Male	Reference	Reference	Reference	Reference	Reference	Reference
Education						
≥ 12 years	0.28 (0.13; 0.60)	0.22 (0.10; 0.49)	0.19 (0.06; 0.58)	0.15 (0.05; 0.46)	*	*
9 to 11 years	0.31 (0.20; 0.49)	0.27 (0.17; 0.44)	0.45 (0.27; 0.74)	0.39 (0.23; 0.66)	0.26 (0.09; 0.80)	0.22 (0.07; 0.69)
≤ 8 years	Reference	Reference	Reference	Reference	Reference	Reference

CI: confidence interval. * Impossible to estimate OR and CI 95% for having few individuals in the reference category; Values in bold: significant difference.

DISCUSSION

The main results of this study show that about 70% of servers have two or more sedentary behaviors simultaneously. Female servers were more exposed to three sedentary behaviors simultaneously. In addition, servers with nine or more years of schooling were less likely of having two and three sedentary behaviors at the same time. In addition, servers with nine to 11 years of schooling were also less exposed to four sedentary behaviors simultaneously.

The proportions of servers exposed to two or more sedentary behaviors varied from 67.7% for men to 72.7% for women. If we consider only two of the domains that were investigated with respect to the time in sedentary behavior (e.g., sitting time at work and time watching television) and the cutoff used to classify sedentary behavior (≥3 hours), much of the sample investigated remains for at least six hours in sedentary behavior per day. Matthews[15] mapped the sedentary behaviors of Americans and found that participants spent 54.9% of their time or 7.7 hours / day in sedentary behaviors. The proportion of Brazilian adults who watched TV for three or more hours per day was 28.9%[16]. In addition, in the city of Pelotas (RS), a study found that, on average, adults reported spending 5.8 hours per day in the sitting position. The adoption of combined sedentary behaviors can be potentially harmful to the general population. In workers, it can lead to conditions for labor disabilities and leaves, impacting costs for companies.

The chance of having little active commuting isolated and the combination of this behavior with TV time / day greater than or equal to three hours was lower among younger servers. Inverse association was observed in the city of Pelotas, whose sedentary commuting time was longer in young adults[11]. In another study[17], with Brazilian adults, using active commuting

such as walking and cycling was associated with low socioeconomic status. The explanation for these findings may relate to the moment of hiring servers, in which younger individuals have less time for income accumulation and may have better physical conditions to move more actively to their work.

Women are more exposed to sitting time at work, to the combination of this domain with little active commuting and three sedentary behaviors simultaneously, regardless of domain. In an American survey in which sedentary behavior was directly measured, women were also more sedentary than men in different contexts of daily life before the age of 30, but this pattern was reversed after the age of 60 due to retirement and comorbidities associated with aging[15]. In contrast, in a city in southern Brazil, when only the field of commuting, Mielke et al[11] found that men commuted less actively to work.

Sedentary behavior at work is possibly related to the demands of jobs occupied by these women (e.g. administrative functions), and this is often something that cannot be changed. However, the reduction of total sedentary time and small changes in work routine such as discontinuation of sedentary behavior (e.g pauses for short stretches) can provide health benefits for workers[18, 19]. According to an experimental research conducted by Alkhajah et al.[20], the introduction of a sitting / standing workstation can substantially reduce the sitting time of office workers both in the workplace and throughout the week.

In the simultaneity analysis, servers with higher education were less exposed to sedentary behavior regardless of domain. In combinations, associations occurred for little active commuting with computer time and sitting time and combination of computer time and sitting time. Alone, all domains were associated, indicating lower exposure of servers with higher schooling for little active commuting, computer time and sitting time and higher TV time for servers with intermediate schooling.

A study of Pelotas-RS also adopted analysis by sedentary behavior domains and found that TV time was higher among those with lower educational level and socioeconomic status[11.] Stamatakis et al[10] suggests that TV time is a habit that can be more dependent on attributes related to education than to financial aspects. These findings indicate that servers with higher educational level have adopted more active habits in relation to sedentary behavior domains than their peers. However, those with 9-11 years of education were more likely to have sedentary behavior for the TV time domain. In a secular tendency study of the adult population of Brazilian capitals and the Federal District, in the period from 2006 to 2013 there was a tendency for a significant decrease in the behavior of watching TV for at least three hours per day, in the age group of 18-24 years. However, this behavior remained stable in the adult population, in both sexes, in the other age groups and educational levels. However, the reduction found can only mean a diversification of new types of screen, like computer, smart phones, among others[21] It has been speculated that watching TV is still as a form of recreation, and is one of the oldest and most accessible information vehicles compared to computer, regardless of educational level.

The associations of different domains of sedentary behavior with schooling were also investigated in other studies and the results diverge from the present investigation. In Australian adults, high socioeconomic status (included educational level) was associated with greater total sitting time and computer time[10]. In Portugal, the higher the educational level of adult, the longer the time spent in sedentary activities. Among Brazilians, those with higher schooling and income were more likely to being exposed to separate or simultaneous sedentary behaviors [22]. In another national study conducted in capitals of the northeastern region of Brazil with more than 140 thousand adults over 18 years of age, there was a trend of reduction in active displacement among adults with low and medium schooling[23]. This indicates that the associated factors, as well as the direction and strength of association, may depend on the behavior investigated. [24] In addition, the different instruments used to investigate sedentary behavior have limited the comparison and understanding of studies[7].

The main limitation of the study is the impossibility of estimating the total sitting time due to the instrument used. Among strengths of the study, we highlight that the analysis of the simultaneity allowed exploring the sedentary behavior patterns presented by servers, contributing to the discussions about the behavior patterns presented by adults in relation to sociodemographic characteristics. In addition, the representative characteristic of the sample allows the extrapolation of results observed for the entire population of servers of Higher Education Institutions.

In practical terms, these results are useful for developing and implementing strategies for promoting the health of servers. They also enable working together with the different health centers of the university in order to intervene mainly in groups most at risk to sedentary behavior in the various domains.

CONCLUSION

Sedentary behavior was present in approximately all servers. Higher schooling was associated to all domains alone and also the least chance of presenting two or more behaviors simultaneously. The association with sex and age varied according to the domain of the sedentary behavior analyzed.

REFERENCES

1. Sardinha LB, Magalhães J. Comportamento Sedentário – Epidemiologia e Relevância. Rev Factores Risco 2012(27):54-64.
2. Sedentary Behaviour Research Network. Standardized use of the terms "sedentary" and "sedentary behaviours". Appl Physiol Nutr Metab 2012;37(3):540-542.
3. Tremblay MS, Aubert S, Barnes JD, Saunders TJ, Carson V, Latimer-Cheung AE, et al. Sedentary Behavior Research Network (SBRN) – Terminology Consensus Project process and outcome. Int J Behav Nutr Phys Act 2017;14(1):75.
4. Rydin Y, Bleahu A, Davies M, Dávila JD, Friel S, De Grandis G, et al. Shaping cities for health: complexity and the planning of urban environments in the 21st century. Lancet 2012;379(9831):2079-2108.
5. Wilmot EG, Edwardson CL, Achana FA, Davies MJ, Gorely T, Gray LJ, et al. Sedentary time in adults and the association with diabetes, cardiovascular disease and death: systematic review and meta-analysis. Diabetologia 2012;55(11):2895-2905.

6. Loyen A, Verloigne M, Van Hecke L, Hendriksen I, Lakerveld J, Steene-Johannessen J, et al. Variation in population levels of sedentary time in European adults according to cross-European studies: a systematic literature review within DEDIPAC. Int J Behav Nutr Phys Act 2016;13(71):1-11.
7. Owen N, Bauman A, Brown W. Too much sitting: a novel and important predictor of chronic disease risk? Br J Sports Med 2009;43(2):81-83.
8. World Health Organization. A conceptual framework for action on the social determinants of health. Geneva: World Health Organization; 2010.
9. Stamatakis E, Grunseit AC, Coombs N, Ding D, Chau JY, Phongsavan P, et al. Associations between socio-economic position and sedentary behaviour in a large population sample of Australian middle and older-aged adults: The Social, Economic, and Environmental Factor (SEEF) Study. Prev Med 2014;63:72-80.
10. Mielke GI, Silva ICM, Owen N, Hallal PC. Brazilian Adults' Sedentary Behaviors by Life Domain: Population-Based Study. PLoS ONE 2014;9(3) e91614.
11. Bernardo AFB, Silva AKF, Napoleão LL, Nalini CD, Rossi RC, Pastre CM, et al. Caracterização das categorias de atividade física e associação com variáveis antropométricas de funcionários universitários. Rev Bras Ciên Mov 2013;21(2):89-97.
12. Berria J, Petroski EL, Minatto G. Overweight and obesity and associated factors in technical and administrative staff at a Brazilian Federal University. Rev Bras Cineantropom Desempenho Hum 2013;15(5):535-50.
13. Barros MVG. Atividades físicas no lazer e outros comportamentos relacionados à saúde dos trabalhadores da indústria no estado de Santa Catarina, Brasil. [Dissertação de Mestrado – Programa de Pós-Graduação em Educação Física]. Florianópolis (SC): Universidade Federal de Santa Catarina; 1999.
14. Matthews CE, Chen KY, Freedson PS, Buchowski MS, Beech BM, Pate RR, et al. Amount of time spent in sedentary behaviors in the United States, 2003-2004. Am J Epidemiol 2008;167(7):875-881.
15. Mielke GI, Hallal PC, Rodrigues GBA, Szwarcwald CL, Santos FV, Malta DC. Prática de atividade física e hábito de assistir à televisão entre adultos no Brasil: Pesquisa Nacional de Saúde 2013. Epidemiol Serv Saúde 2015;24(2):277-286.
16. Reis HFC, Ladeia AMT, Passos EC, Santos FGO, Wasconcellos LT, Correia LCL, et al. Prevalência e variáveis associadas à inatividade física em indivíduos de alto e baixo nível socioeconômico. Arq Bras Cardiol 2009;92(3):203-208.
17. Parry S, Straker L. The contribution of office work to sedentary behaviour associated risk. BMC Public Health 2013;13(1):296.
18. Katzmarzyk PT, Church TS, Craig CL, Bouchard C. Sitting time and mortality from all causes, cardiovascular disease, and cancer. Med Sci Sports Exerc 2009;41(5):998-1005.
19. Alkhajah TA, Reeves MM, Eakin EG, Winkler EA, Owen N, Healy GN. Sit-stand workstations: a pilot intervention to reduce office sitting time. Am J Prev Med 2012;43(3):298-303.
20. Malta D, Andrade S, Santos M, Rodrigues G, Mielke G. Tendências dos indicadores de atividade física em adultos: Conjunto de capitais do Brasil 2006-2013. Rev Bras Ativ Fís Saúde 2015;20(2):141-151.
21. Garcia LMT, Barros MVG, Silva KS, Del Duca GF, Costa FF, Oliveira ESA, et al. Aspectos sociodemográficos associados a três comportamentos sedentários em trabalhadores brasileiros. Cad Saúde Públic 2015;31(5):1015-1024.
22. Tassitano R, Mielke G, Carvalho W, Oliveira M, Malta D. Tendência temporal de indicadores da prática de atividade física e comportamento sedentário nas capitais da Região Nordeste do Brasil: 2006-2013. Rev Bras Ativ Fís Saúde 2015;20(2):152-164.
23. Rhodes RE, Mark RS, Temmel CP. Adult sedentary behavior: a systematic review. Am J Prev Med 2012;42(3):3-28.

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