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ORIGINAL

Overweight and associated factors in Basic Education teachers during the Covid-19 pandemic: gender differentials

Excesso de peso e fatores associados entre professores da Educação Básica durante a pandemia de Covid-19: diferenciais de sexo

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ABSTRACT

Objective

To estimate the prevalence of overweight among teachers in *Minas Gerais* during the Covid-19 pandemic and to review relevant gender associated factors.

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Methods

Cross-sectional and analytical study, websurvey type, carried out with 15,641 teachers of public Basic Education in *Minas Gerais*, Brazil. Data collection took place from August to September 2020 with the use of a digital form. The dependent variable was overweight, calculated by the body mass index using the teachers' self-reported weight and height. Poisson regression was used, with robust variance.

Results

Among the participating teachers, 52.4% were overweight. When stratified by gender, 51.1% women and 58.2% men were considered overweight, with a significant difference between them (p<0.001). There was a higher prevalence of overweight among women in the age group of 30 to 59 years (PR=1.39) and in women 60 years or older (PR=1.45) living in the metropolitan region of the state (PR=1.06) who had children (PR=1.19), who were not exercising (PR=1.09) and with a worse dietary pattern during the pandemic (PR=1.12), much afraid of Covid-19 (PR=1.04) and with anxiety and/or depression during the pandemic (PR=1.14). Among men, there was a higher prevalence of overweight among those individuals aged 30 to 59 years (PR=1.19), who lived with a spouse (PR=1.15) working more than 40 hours per week (PR=1.12) and those with the worst dietary pattern during the pandemic (PR=1.10).

Conclusion

The results showed a 52.4% prevalence of overweight teachers and different associated factors between the genders.

Keywords: Body mass index. Coronavirus. Health surveys. Overweight. School teachers.

RESUMO

Objetivo

Estimar a prevalência de excesso de peso entre professores de Minas Gerais durante a pandemia de Covid-19 e analisar os fatores associados segundo o sexo.

Métodos

Estudo transversal e analítico, do tipo websurvey, realizado com 15.641 professores da educação básica pública de Minas Gerais, Brasil. A coleta de dados ocorreu de agosto a setembro de 2020, via formulário digital. A variável dependente foi o excesso de peso, calculado pelo índice de massa corporal através do peso e altura autorreferidos pelos professores. Utilizou-se a Regressão de Poisson, com variância robusta.

Resultados

Entre os professores participantes, 52,4% estavam com excesso de peso. Quando estratificado por sexo, 51,1% das mulheres e 58,2% dos homens estavam com excesso de peso, apresentando diferença significativa entre eles (p<0,001). Houve maior prevalência de excesso de peso entre as mulheres de 30 a 59 anos (RP=1,39) e 60 anos ou mais (RP=1,45), da região metropolitana do Estado (RP=1,06), com filhos (RP=1,19), que não estavam praticando exercício físico durante a pandemia (RP=1,09), com pior padrão alimentar durante a pandemia (RP=1,12), com muito medo da Covid-19 (RP=1,04) e com ansiedade e/ou depressão durante a pandemia (RP=1,14). Entre os homens, houve maior prevalência de excesso de peso entre aqueles de 30 a 59 anos (RP=1,19), que viviam com cônjuge (RP=1,15), que trabalhavam mais de 40 horas semanais (RP=1,12) e aqueles com pior padrão alimentar durante a pandemia (RP=1,10).

Conclusão

Os resultados evidenciaram que 52,4% dos professores respondentes estavam com excesso de peso, tendo sido encontrados diferentes fatores associados entre os sexos.

Palavras-chave: *Índice de massa corporal. Coronavirus. Inquérito epidemiológico. Excesso de peso. Professores escolares.*

INTRODUCTION

Teaching work is associated with low energy expenditure, being one of the professions with a higher risk of developing overweight and obesity, when compared to the general population [1]. The reasons for overweight development are reported in the literature [2] and include individual conditions, such as energy

imbalance between calories intake and calories expended, due to changes in eating habits, physical exercise, watching television, smartphone and computer use [2,3]. There are also collective issues that include policies for health education access, urban planning and transportation, food processing and distribution, among others [2]. In addition, due to the number of low-intensity activities, teacher's work is considered as a sedentary activity [4].

According to the World Health Organization (WHO), the prevalence of overweight individuals in the world population was 39% [2]. In Brazil, data from Vigitel, the Ministry of Health's surveillance system that monitors determinants of chronic non-communicable diseases in the adult population of the 26 capitals and the Federal District of the country, indicate that overweight has expanded. In 2019, before the outbreak of the Coronavirus disease 2019 (Covid-19) pandemic, prevalence of overweight was 55.4% and in 2021, during the pandemic, a prevalence of 57.2% was observed [5,6]. Also, the assessment of a Brazilian cohort composed of 14,259 adults found a 49.0% overweight prevalence during the pandemic [3].

With the emergence of the pandemic, some conditions contributed to the development of overweight among teachers. The implementation of social distancing (as a public health measure) affected the diet, made physical exercise and leisure activities difficult [7]. These conditions associated with remote teaching and more screen time, increased sedentary behavior and reduced energy expenditure, which consequently contributed to the development of overweight [8].

Based on the literature, women and men differ in relation to health care, with males having worse habits, less self-care and being more prone to risk factors [9]. Therefore, the present study aimed to estimate the prevalence of overweight among public Basic Education teachers in the State of *Minas Gerais* during the Covid-19 pandemic and to review its associated factors, stratified by gender.

METHODS

This study is part of the project "Health and work conditions among teachers of the state education network in the State of *Minas Gerais* during the Covid-19 pandemic". This is a cross-sectional and analytical study, websurvey type, carried out with Basic Education teachers from public schools in the State of *Minas Gerais*, Brazil. The State of *Minas Gerais* had 90,000 Basic Education teachers in 2020. Those teachers worked in 3,441 schools [10]. As this is a websurvey study, the instructions of the Checklist for Reporting Results of Internet E-Surveys [11] were followed.

For the sample size, a formula was used considering infinite populations. The following were considered: prevalence of 50%, 3% error, deff=2 and 20% addition to compensate for potential losses. Thus, a minimum sample of 2,564 teachers was formed.

The inclusion criteria were: be teaching in the year 2020, working within the scope of early childhood education, elementary and/or high school, having a link with a public school in the state and freely accepting to participate in the study. Retired teachers and those working in a position other than teaching did not participate. There was no restriction on the participation of teachers who were on sick leave.

The survey was disseminated by e-mail and on the social media of the *Secretaria de Estado de Educação de Minas Gerais* (SEE-MG, *Minas Gerais* State Department of Education), aiming to raise awareness among participants. A pilot study was carried out with the participation of a total of 20 teachers from five municipalities to test and correct the data collection instrument,

The survey took place from August 20 to September 11, 2020. Data collection was carried out using an online form, made available to teachers via the Google Forms® platform. The form link was

forwarded by SEE-MG to the teachers' institutional e-mail in the state. To avoid robotic form completion systems, reCAPTCHA was used. In order to minimize information loss all the instrument questions should be responded. The study ensured the anonymity of the participants. Completion of the form took approximately 25 minutes.

In this work we adopted the teachers' overweight as a dependent variable. To estimate overweight, the Body Mass Index (BMI) "weight (kg) / height $(m)^2$" was calculated through the teachers' self-reported weight and height. Individuals were classified according to their BMI using the cutoff points established by the WHO: eutrophic ≤24.9 Kg/m^2, overweight from 25 to 29.9 Kg/m^2 and obese ≥30 Kg/m^2 [12]. For the present study, BMI levels were categorized as not overweight (BMI <25 Kg/m^2) and overweight (BMI ≥25 Kg/m^2). In order to improve the reliability of the results, teachers who reported being pregnant at the time of the survey were excluded from the analysis.

The independent variables were organized in blocks of subjects, such as the demographic characteristics: age, state metropolitan region, lives with spouse and has children. The age variable was collected in complete years on the date of the survey and subsequently categorized as follows: 30 years of age; 30 to 59 years; 60 years or older. The metropolitan region refers to the state school where the teacher worked and covers the state capital and the municipalities around it.

Working conditions: weekly teaching hours, dissatisfaction with teaching work during the pandemic and had a lot of difficulty with teaching work during the pandemic. The hours of weekly teaching were collected in numerical format and afterwards categorized as less than 40 hours; 40 hours or more.

Lifestyle and health: physical exercise during the pandemic as well as daily computer use, eating during the pandemic, adherence to social distancing, tested positive for Covid-19, showed great fear of Covid-19, anxiety and/or depression during the pandemic (referring to self-reported medical diagnosis) and the pandemic affected sleep quality. Computer use per day during the pandemic was collected in numerical format and then categorized in less than 4 hours; 4 hours or more. To describe the food variable, a two-step cluster analysis was performed, through the inclusion of nine questions (consumption of vegetables/legumes, fruits, beans, whole foods, processed foods, frozen foods, packaged snacks, chocolate/sweets and artificial soft drinks/juices). The analysis revealed two clusters capable of discriminating patterns of eating behaviors, being classified as "best" vs "worst" eating pattern. The fear of Covid was measured by the Fear of Covid-19 Scale already validated for Brazil [13-14]. This is an instrument that investigates people's fear of Covid-19. The scale presents items that are answered on a Likert-type scale. The total score was obtained based on the sum of the items (ranging from 7 to 35 points), being categorized as "much afraid" presenting 27 or more points.

Data were analyzed using the SPSS®IBM® (version 22.0) [15]. The simple and relative frequencies of the variables were presented. These analyses were stratified by gender. For the analysis of the factors associated with overweight, bivariate analyses were previously performed using Pearson's Chi-square statistical test and the crude Prevalence Ratio (PR) and the 95% Confidence Interval (95% CI) of the independent variables in relation to the dependent one. Only the variables that presented p-value ≤0.20 were initially selected to compose the multiple model through Poisson Regression, with robust variance, having as reference the teachers who were not overweight. The magnitude of the associations of the multiple model was estimated by the adjusted PR, 95% CI and 5% significance level. To assess the quality of the models, the Deviance test was used.

The project was submitted to the Research Ethics Committee of the State University of *Montes Claros* (Unimontes), with opinion nº 4,200,389, approved in August 2020. All professors received the Free and Informed Consent Form. The research complied with resolution nº 466/12 of the National Health Council/Ministry of Health, which deals with human research.

RESULTS

A total of 15,641 teachers participated in the study, covering 93.2% of *Minas Gerais* municipalities. Among those teachers, 81.9% were women and 89.2% were between 30 and 59 years of age, 66.8% lived with a spouse, 33.7% were dissatisfied with their teaching work during the pandemic, 50.5% had a worst dietary pattern and 43.7% were much afraid of Covid-19.

Teachers with excess weight were 52.4%; 28.5% were overweight and 23.9% obese. Regarding the gender, 51.1% of the women and 58.2% of the men were overweight, with a statistically significant difference between them (p<0.001) (Figure 1).

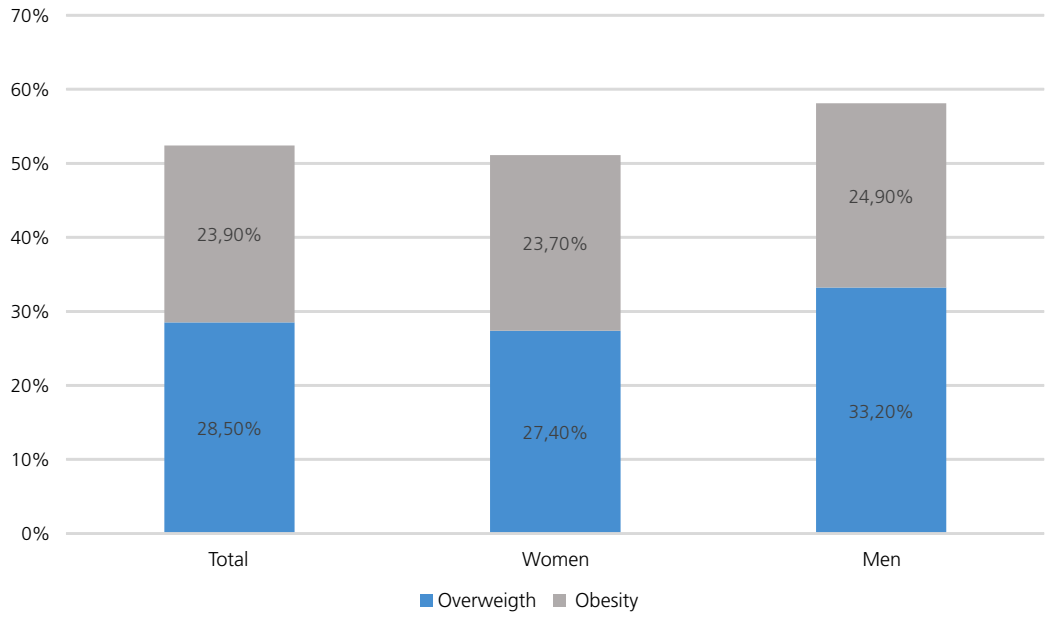

Figure 1 – Prevalence of overweight among teachers of public Basic Education in *Minas Gerais*, total and stratified by gender. *Minas Gerais* (MG), 2020, Brazil. (n=15.641).
Note: Pregnant women were excluded from the analyses (n=246). Variation in n due to loss of information.

Tables 1 and 2 present the results of the bivariate analysis and crude PR, for women and men, respectively. Among women, only the independent variables daily computer use during the pandemic and adherence to social distancing were not associated with being overweight at the 20% significance level (Table 1). Among men, the independent variables metropolitan region, a lot of difficulty with work, computer use per day during the pandemic, adherence to social distancing and much fear of Covid-19, were also not associated with overweight at 20% significance level and were not initially considered in the multiple modeling (Table 2).

Table 3 presents the multiple models fit for women and men. There was a higher prevalence of overweight among women aged 30 to 59 years (PR=1.39; 95% CI: 1.25;1.54) and 60 years or older (PR=1.45; 95% CI: 1.27;1.67), those from the metropolitan region of the state (PR=1.06; 95% CI: 1.02;1.10), with children (PR=1.19; 95% CI: 1.14;1.25), who were not exercising during the pandemic (PR=1.09; 95% CI: 1.05;1.12), with a worse dietary pattern during the pandemic (PR=1.12; 95% CI: 1.08;1.16), much afraid of Covid-19 (PR=1.04; 95% CI: 1.01;1.08) and with anxiety and/or depression during the pandemic (PR=1.14; 95% CI: 1.10;1.18) (Table 3).

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Table 1 – Overweight among female teachers of public Basic Education in *Minas Gerais* according to their demographic characteristics, working conditions, lifestyle and health. *Minas Gerais* (MG), 2020. (n= 12.817).

Variables	Overweight*				PR $_{Crude}$ (95% CI)	*p*-value
	No		Yes			
	n	%	n	%		
Demographic characteristics						
Age*						<0.001
Less than 30 years	490	66.1	251	33.9	1.00	
30 to 59 years	5,461	47.9	5,944	52.1	1.53 (1.38;1.70)	
60 years or older	195	46.7	223	53.3	1.57 (1.37;1.80)	
Metropolitan region of the state						0.003
No	4,823	49.6	4,893	50.4	1.00	
Yes	1,328	46.4	1,531	53.6	1.06 (1.02;1.10)	
Lives with spouse						<0.001
No	2,085	51.3	1,983	48.7	1.00	
Yes	4,066	47.8	4,441	52.2	1.07 (1.03;1.11)	
Has children						<0.001
No	1,672	57.5	1,236	42.5	1.00	
Yes	4,479	46.3	5,188	53.7	1.26 (1.20;1.32)	
Work conditions						
Weekly teaching hours*						0.081
Less than 40 hours	5,263	49.2	5,429	50.8	1.00	
40 hours or more	871	47.0	981	53.0	1.04 (0.99;1.09)	
Dissatisfaction with teaching work DP						0.060
No	4,176	49.5	4,260	50.5	1.00	
Yes	1,975	47.7	2,164	52.3	1.03 (0.99;1.07)	
Had a lot of difficulty with teaching work DP						<0.001
No	4,963	49.7	5,018	50.3	1.00	
Yes	1,188	45.8	1,406	54.2	1.07 (1.03;1.12)	
Lifestyle and health						
Physical exercise DP						<0.001
Yes	3,584	51.7	3,346	48.3	1.00	
No	2,567	45.5	3,078	54.5	1.12 (1.09;1.16)	
Computer use per day DP						0.361
Less than 4 hours	603	50.2	599	49.8	1.00	
4 hours or more	5,548	48.8	5,825	51.2	1.02 (0.96;1.09)	
Food DP						<0.001
Best eating pattern	3,373	52.0	3,109	48.0	1.00	
Worst eating pattern	2,778	45.6	3,315	54.4	1.13 (1.09;1.17)	
Adherence to social distancing						0.323
Totally	5,042	48.7	5,309	51.3	1.00	
Partially / None	1,109	49.9	1,115	50.1	0.97 (0.93;1.02)	
Tested positive for Covid-19						0.165
No	6,081	49.0	6,333	51.0	1.00	
Yes	70	43.5	91	56.5	1.10 (0.96;1.27)	
Showed a lot of fear of Covid-19						<0.001
No	3,451	50.9	3,327	49.1	1.00	
Yes	2,700	46.6	3,097	53.4	1.08 (1.05;1.12)	
Anxiety and/or depression DP						<0.001
No	4,634	51.2	4,408	48.8	1.00	
Yes	1,517	42.9	2,016	57.1	1.17 (1.13;1.21)	
Pandemic has affected sleep quality						<0.001
No	2,670	51.6	2,500	48.4	1.00	
Yes	3,481	47.0	3,924	53.0	1.09 (1.05;1.13)	

Note: *Variation in n due to loss of information. Pregnant women were excluded from the analyzes (n=246). p-value: Pearson's chi-square. CI: Confidence Interval; DP: During the Pandemic; Prevalence Ratio.

Table 2 – Overweight among male public Basic Education teachers in *Minas Gerais* according to demographic characteristics, working conditions, lifestyle and health. *Minas Gerais* (MG), Brazil, 2020. (n=2.824).

Variables	Overweight*				PR_{Crude} (95% CI)	*p*-value
	No		Yes			
	n	%	n	%		
Demographic characteristics						
Age*						<0.001
Less than 30 years	203	52.6	183	47.4	1.00	
30 to 59 years	917	39.7	1,392	60.3	1.27 (1.13;1.42)	
60 years or older	52	47.3	58	52.7	1.11 (0.90;1.36)	
Metropolitan region of the state						0.734
No	894	41.6	1,253	58.4	1.00	
Yes	281	42.4	382	57.6	0.98 (0.91;1.06)	
Lives with spouse						<0.001
No	518	47.8	566	52.2	1.00	
Yes	657	38.1	1,069	61.9	1.18 (1.10;1.27)	
Has children						<0.001
No	594	45.8	704	54.2	1.00	
Yes	581	38.4	931	61.6	1.13 (1.06;1.21)	
Work conditions						
Weekly teaching hours*						<0.001
Less than 40 hours	984	43.6	1,272	56.4	1.00	
40 hours or more	190	35.0	353	65.0	1.15 (1.07;1.23)	
Dissatisfaction with teaching work DP						0.135
No	759	42.9	1,011	57.1	1.00	
Yes	416	40.0	624	60.0	1.05 (0.98;1.12)	
Had a lot of difficulty with teaching work DP						0.458
No	949	42.2	1,302	57.8	1.00	
Yes	226	40.4	333	59.6	1.03 (0.95;1.11)	
Lifestyle and health						
Physical exercise DP						0.042
Yes	758	43.3	993	56.7	1.00	
No	417	39.4	642	60.6	1.06 (1.01;1.13)	
Computer use per day DP						0.324
Less than 4 hours	145	44.3	182	55.7	1.00	
4 hours or more	1,030	41.5	1,453	58.5	1.05 (0.94;1.16)	
Food DP						0.002
Best eating pattern	503	45.4	606	54.6	1.00	
Worst eating pattern	672	39.5	1,029	60.4	1.10 (1.03;1.18)	
Adherence to social distancing						0.259
Totally	787	41.1	1,128	58.9	1.00	
Partially / None	388	43.4	507	56.6	0.96 (0.89;1.03)	
Tested positive for Covid-19						0.093
No	1,170	42.0	1,619	58.0	1.00	
Yes	5	23.8	16	76.2	1.31 (1.03;1.67)	
Showed much fear of Covid-19						0.571
No	801	42.2	1,098	57.8	1.00	
Yes	374	41.1	537	58.9	1.01 (0.95;1.09)	
Anxiety and/or depression DP						0.150
No	997	42.4	1,354	57.6	1.00	
Yes	178	38.8	281	61.2	1.06 (0.98;1.15)	
Pandemic has affected sleep quality						0.046
No	614	43.7	792	56.3	1.00	
Yes	561	40.0	843	60.0	1.06 (1.01;1.13)	

Note: *Variation in n due to loss of information. p-value: Pearson's chi-square. CI: Confidence Interval; DP: During the Pandemic; Prevalence Ratio.

As for men, there was a higher prevalence of overweight among individuals aged between 30 and 59 years (PR=1.19; 95% CI: 1.06;1.33), who lived with a spouse (PR=1, 15; 95% CI: 1.07;1.23), working more than 40 hours per week (PR=1.12; 95% CI: 1.05;1.21) and with a worse dietary pattern during the pandemic (PR=1.10; 95% CI: 1.03;1.18) (Table 3).

The statistics of the Deviance tests obtained in the final multiple models were equal to 0.674 (*p*-value=0.489) for the women's model and 0.623 (*p*-value=0.420) for the men's model; they both indicated adequate fit of the model (Table 3).

Table 3 – Analysis of the fit Poisson Regression, having the absence of overweight as the reference category among teachers of public Basic Education in *Minas Gerais*, stratified by gender. *Minas Gerais* (MG), Brazil, 2020. (Women: n=12.817 / Men: n=2.824).

Variables	Overweight*			
	Women		Men	
	PR (95% CI)	*p*-value	PR (95% CI)	*p*-value
Demographic characteristics				
Age*		<0.001		0.004
Less than 30 years	1.00		1,00	
30 to 59 years	1.39 (1.25;1.54)		1.19 (1.06;1.33)	
60 years or older	1.45 (1.27;1.67)		1.05 (0.86;1.30)	
Metropolitan region of the state		0.001		-
No	1.00		-	
Yes	1.06 (1.02;1.10)		-	
Lives with spouse		-		<0.001
No	-		1.00	
Yes	-		1.15 (1.07;1.23)	
Has children		<0.001		-
No	1.00		-	
Yes	1.19 (1.14;1.25)		-	
Work conditions				
Weekly teaching hours*		-		0.001
Less than 40 hours	-		1.00	
40 hours or more	-		1.12 (1.05;1.21)	
Lifestyle and health				
Physical exercise DP		<0.001		-
Yes	1.00		-	
No	1.09 (1.05;1.12)		-	
Food DP		<0.001		0.002
Best eating pattern	1.00		1.00	
Worst eating pattern	1.12 (1.08;1.16)		1.10 (1.03;1.18)	
Showed a lot of fear of Covid-19		0.015		-
No	1.00		-	
Yes	1.04 (1.01;1.08)		-	
Anxiety or depression DP		<0.001		-
No	1.00		-	
Yes	1.14 (1.10;1.18)		-	

Note: *Variation in n due to loss of information. Pregnant women were excluded from the analyses (n=246). Model (Women): Deviance: 0.674 / *p*-value: 0.489; Model (Men): Deviance: 0.623 / p-value: 0.420. CI: Confidence Interval; DP: During the Pandemic; PR: Prevalence Ratio.

DISCUSSION

This study found a high prevalence of overweight public school teachers in the State of *Minas Gerais* during the Covid-19 pandemic and its association with sociodemographic, behavioral and health factors.

Among women, the greatest overweight prevalence was observed in older women, who worked in the metropolitan region of the state, had children and were not exercising, with a worse dietary pattern, with much fear of Covid-19 and with diagnosis of anxiety and/or depression. Among men, a higher prevalence of overweight was observed among those aged between 30 and 59 years, living with a spouse, working more than 40 hours a week and with a worse dietary pattern.

The prevalence of overweight observed in more than half of the teachers is a relevant nutritional diagnosis for the health of this category of workers, since this condition represents a serious public health issue. These results are similar to those of other studies carried out with teachers before the pandemic in relation to excess body weight and also with the Brazilian population in general [16-21].

When stratified by gender, it was observed that the prevalence of overweight was higher among men (58.2%) than among women (51.1%), with a statistically significant difference between them. The difference between women and men in relation to overweight was also found in a previous study that was representative of the Brazilian adult population; again in this case a prevalence of overweight among men was observed [21]. This may indicate that women would be more aware of the health benefits of caring for the body [22].

Greater overweight prevalence was observed in the present study, between women and men aged between 30 and 59 years; in addition women aged 60 years or older also exhibited overweight prevalence. Similar results were found in studies carried out with the Brazilian adult population. Greater overweight prevalence was observed between men and women aged 35 to 54 years [21]. On the other hand, a study conducted only with women, it was found that women aged 50 to 60 years had a higher prevalence of obesity [22]. These data also coincide with a study that identified a lower overweight prevalence among younger adults [23]. In other studies, it was shown that the prevalence of overweight and obesity tends to increase with age [24,25]. Such a relationship occurs due to biological characteristics, hormonal changes, reduction of muscle mass, less energy for physical exercise and the menopause process among women, but it may also be associated with the reduction of health care [1,23,26,27].

Within the framework of the Covid-19 pandemic, we could expect that older teachers faced greater difficulties in adapting to the remote work routine, including the use of new technologies. Therefore, they may have dedicated more time than usual to work, spending more time sitting in front of the computer and, finally, reducing the time for exercise and personal care.

In the present study, we found a prevalence of overweight women working in the metropolitan region of the state. Working and living in large cities is possibly associated with less time for activities that cause energy expenditure. Instead passive commuting to work, less time for physical exercise and fast food diets become the rule as people living in large cities rush through life, and these habits constitute risk factors for non-communicable chronic diseases [28-31].

Although, the variable "living with a spouse" was included in the multiple model for both genders it remained associated with overweight only among men in the fit model. Previous studies also showed a relationship between overweight or obesity and being in a stable relationship with a spouse [1,25,32]. Studies suggest that this is because people who live in a stable relationship have greater social support and less concern about appearance, in addition to paying less attention to nutritional factors, such as increased consumption of caloric foods [3,32].

The variable "having children" showed a similar behavior and was, therefore, included in the multiple model for both genders. However, overweight was only observed among women in the fit model. The double working day, especially for women who have children, further reduces the time available for physical activity and leisure, contributing to greater sedentary behavior [31,33]. Added to this is the fact that

overweight gain during pregnancy can be difficult for women to eliminate and to return to their previous weight after pregnancy [34,35].

The results of the present study also showed an association between overweight and teachers working more than 40 hours a week. This corroborates a study that evaluated the level of physical exercise of public school teachers and that showed that 67.6% of teachers working more than 40 hours a week were inactive or insufficiently active. Thus, a longer working time per week may be associated with less time available for health care [36].

Regarding the practice of physical exercise during the pandemic, the fit model showed a higher prevalence of overweight among women who were not exercising, and that there was also a loss of statistical significance with regard to men. A Brazilian study carried out with teachers during the pandemic found that 60.8% were physically inactive [37]. This result was also seen in a study that evaluated the physical exercise level of Brazilians before and during the pandemic, which found a reduction in physical exercise levels for both genders, but for women, the reduction was even more relevant [38]. Studies conducted before the pandemic, with university professors and with teachers from public schools in small and medium-sized municipalities [39,36,40], also found that female teachers were considered inactive or insufficiently active more frequently than men. Over the years, it has been reported in the literature that women are less physically active since childhood, and this may be explained by social factors [41]. With the restriction of suitable places to perform physical exercise and longer time indoors, there was a significant reduction in caloric expenditure, leading to an increase in body weight [42].

Having a worse dietary pattern during the pandemic – *i.e.* greater consumption of ultra-processed foods – was also associated with a higher prevalence of overweight in both genders [43]. This corroborates a Brazilian study that showed that consumption of ultra-processed foods twice or more times a week increased in both genders during the pandemic [38]. The worsening of the dietary pattern was also observed in a survey with Poles, which reported that 43.5% of the population began to eat more during the pandemic, in addition to having small snacks between the main meals, and the increase was more frequent in participants with overweight [44]. Consuming healthy foods regularly prevents possible chronic non-communicable diseases; healthy food is a source of vitamins and contributes to the balance of body weight [43]. Furthermore, during the pandemic, eating was impacted by different factors, such as the loss in the supply of fresh food, especially fruits and vegetables, closing of street markets and restaurants, increase in food costs, among others [45].

Fear of Covid-19 and the presence of anxiety and depression were associated with women overweight. In pre-pandemic studies, overweight associated with mental health problems was also observed [46-48]. Worry and fear can lead to the worsening of mental health conditions and these feelings can be potentiated considering the pandemic period [49,50]. The fact that this outcome was found only in women can be explained by the fact that women tend to be more sensitive to psychological stress and that they also have a greater perception of stressful situations [50,51]. The increase in psychological factors such as stress, anxiety, depression and even boredom are related to a higher calorie intake, through the consumption of the so-called "comfort foods" [42].

Some limitations of the study should be highlighted. The use of self-reported weight and height to obtain the BMI variable is one of the limitations. However, there are studies that point out that self-report is correlated with measured data, indicating a valid use of this strategy, which is also widely applied in health surveys [52,53]. Other limitations are the participation of only public schools' teachers and the non-restriction of teachers on sick leave, which can lead to selection bias. Finally, the fact that the research was carried out via the internet also makes this bias possible. However, web surveys have advantages, such as the possibility

of carrying out collections at a distance, geographic coverage, low costs and speed in the publication of results [54]. We also highlight other strong points, such as the partnership with SEE-MG, the robustness of the sample and the 13.3% representativeness of teachers working in rural areas.

CONCLUSION

More than half of the teachers were overweight during the Covid-19 pandemic, with a difference between the genders. When considering the factors ¨being over 30 years of age¨ and ¨having a worse dietary pattern¨ these were associated with both genders. Working in the metropolitan region, having children, not exercising, being much afraid of Covid-19 and having anxiety and/or depression remained associated only with women, and living with a spouse and working 40 or more hours per week were associated only with men. The presentation of these data can contribute to the monitoring of the prevalence of overweight as a strategy to understand risk patterns and their associated factors, and thus support specific and preventive interventions to promote the health of the teaching community.

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CONTRIBUTORS

NSS SILVA worked on the design, research data collection, methodological and statistical analyses, data interpretation, writing and final review of the article. BN SANTOS contributed in the interpretation of data, writing and final review of the article. REC BARBOSA and L PINHO in the design, research data collection, methodological analysis and final review of the article. RRV SILVA and DS HAIKAL contributed in the coordination and design, research data collection, methodological and statistical analysis, data interpretation, writing and final review of the article.

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