




## Food consumption and remote working conditions among Brazilian Primary Schools teachers during the COVID-19 pandemic

Audrey Handyara Bicalho<sup>1</sup> , Geórgia das Graças Pena<sup>2</sup> , Desirée Sant'Ana Haikal<sup>3</sup> ,  
Rosângela Ramos Veloso Silva<sup>3</sup> , Sabrina Alves Durães<sup>4</sup> , Luciana Neri Nobre<sup>5</sup> ,  
Lucineia de Pinho<sup>3</sup> .

**Abstract:** Food consumption and remote working conditions among Brazilian Primary Schools teachers during the COVID-19 pandemic. **Introduction:** Teaching work, which is characterized by being exhausting, with a significant workload, with synchronous and/or asynchronous remote classes. **Objective:** To describe associations between the working conditions of school teachers at home and their food consumption during the suspension of face-to-face classes. **Materials and methods:** Cross-sectional study using a self-administered online questionnaire with 15,372 working teachers from Minas Gerais, Brazil. The dependent variables analyzed were the consumption of healthy and unhealthy foods. Independent variables included sociodemographic factors, remote work conditions, understanding of online technologies, computer access, and quality of Internet connection. The Poisson model with robust variance was used to determine the association between working conditions and food consumption. **Results:** In the analysis of the adjusted multivariate model, there was a significant association between eating habits and the following variables: gender, age, working hours (per week), feelings regarding teachers' work during the pandemic, working hours during the pandemic and quality work internet connection. Our data shows that teachers' remote working conditions are associated with worse food consumption. They also showed that working hours equal to or greater than 40 hours per week, feelings of dissatisfaction with working conditions during the pandemic, increased working hours during the pandemic and poor quality of internet connection were variables correlated with the consumption of unhealthy foods. **Conclusions:** Remote working conditions during the pandemic influenced primary school teachers' food choices. More studies are needed to delve deeper into issues related to teachers' working conditions and the implications for food choices. **Arch Latinoam Nutr 2024; 74(1): 42-50.**

**Keywords:** COVID-19; emergency remote teaching; food consumption; occupational health risk; school teachers.

**Resumen:** Consumo de alimentos y condiciones de trabajo remoto en maestros brasileños de básica durante la pandemia de COVID-19 **Introducción:** La labor docente se caracteriza por ser agotadora, con una importante carga horaria, con clases remotas síncronas y/o asíncronas. **Objetivo:** Describir la asociación existente entre las condiciones del trabajo remoto de los docentes de la educación básica y el consumo de sus alimentos durante el período de suspensión de las clases presenciales. **Métodos:** Es un estudio transversal mediante cuestionario en línea autoadministrado con 15.372 docentes activos en Minas Gerais, Brasil. Las variables dependientes analizadas fueron el consumo de los alimentos saludables y de los no saludables. Las variables independientes incluyeron los factores sociodemográficos, las condiciones del trabajo remoto, la comprensión de las tecnologías en línea, el acceso a las computadoras así como la calidad de la conexión a la Internet. Se utilizó el modelo de Poisson con variación robusta para determinar la asociación entre las condiciones del trabajo y el consumo de los alimentos. **Resultados:** En el análisis del modelo multivariado ajustado hubo una asociación significativa entre los hábitos alimentarios y las siguientes variables: el género, la edad, la jornada laboral semanal, el sentimiento sobre el trabajo durante la pandemia, la jornada laboral durante la pandemia y la calidad de la conexión a la internet. Nuestros datos demuestran que las condiciones del trabajo remoto de los docentes están asociadas con un empeoramiento en el consumo de los alimentos. También mostraron que la jornada laboral igual o superior a unas 40 horas semanales, los sentimientos de insatisfacción con las condiciones laborales, el aumento de la jornada laboral y la mala calidad de la conexión a la Internet durante la pandemia fueron variables correlacionadas con el consumo de alimentos no saludables. **Conclusiones:** Las condiciones del trabajo remoto durante la pandemia influyeron en las elecciones alimentarias de los docentes de la educación básica. Se necesitan más estudios para profundizar en los aspectos relacionados con las condiciones laborales de los docentes y sus implicaciones en la elección de sus alimentos. **Arch Latinoam Nutr 2024; 74(1): 42-50.**

**Palabras clave:** COVID-19; enseñanza remota de emergencia; consumo de alimentos; riesgo de salud ocupacional; docentes de educación básica.

### Introduction

In the face of the COVID-19 pandemic, the Brazilian Ministry of Health, in February 2020, following guidelines from the World Health

<sup>1</sup>Federal Institute of Northern Minas Gerais, Montes Claros/MG, Brazil; <sup>2</sup>Federal University of Uberlândia (UFU), Uberlândia/MG, Brazil; <sup>3</sup>State University of Montes Claros (UNIMONTES), Montes Claros/MG, Brazil; <sup>4</sup>Federal University of Minas Gerais- UFMG - Montes Claros Regional Campus /MG, Brazil. Undergraduate in Nutrition; <sup>5</sup>Federal University of the Jequitinhonha and Mucuri Valleys (UFVJM), Diamantina/MG, Brazil; Author for correspondence: Audrey Handyara Bicalho, e-mail: bhandyara@gmail.com



Organization (WHO), prepared the National Contingency Plan for Human Infection by the new Coronavirus COVID-19. As a palliative measure not to paralyze teaching in schools that adopted the face-to-face model of formal education, the Ministry of Education (MEC), in turn, published regulations to enable the flexibility of educational actions by educational institutions in Brazil (1-3).

Thus, there was a global change in the way of teaching and teachers were challenged to adapt to a new working arrangement and most of them faced challenges related to pedagogical and technological skills and the home context, environment, often not suitable for professional activities (4-6). Teachers were pressured in a short period of time to carry out a quick and unstructured change of work at home, to know the platforms used, to adapt their face-to-face content to the remote system, to restructure their teaching to be in contact with students per screen tasks that in the context of the pandemic have become a necessity (7-9). The lack of quality internet access, availability of computers and cell phones in the family nucleus are examples of obstacles that are intertwined with this new work configuration and the domestic routine and, the teaching work, which is characterized by being exhausting, can be even more stressful in view of the exceptional health situation (7,10).

Given this complex context, the following question emerged: how did the abrupt changes in teaching work and in the teaching-learning process, as well as work overload, influence your eating habits, as this relationship has already been determined in different contexts (11).

Studies have shown that the period of social isolation due to COVID-19 influenced eating behaviors and food choices of several populations with different outcomes in relation to changes in eating patterns (12-14). For example, some of these studies show healthier eating behaviors, including organic farming and fruit and vegetable consumption (15). Nevertheless, others show unhealthy eating habits including less frequent consumption of vegetables,

fruits, and legumes, greater adherence to fast food, increased consumption of frozen foods and reduced consumption of natural foods (12,13,16). There are also those who have shown that the pandemic has not significantly changed their diet (15) and who have shown a greater proportion of increased consumption of different food groups, healthy or unhealthy, due to social isolation (17). Although these studies show a variety of scenarios in relation to food behavior, little is known about the relationship between the teaching work and food consumption in this context of pandemic.

Thus, the present study had the purpose of describing associations between home-working conditions and food consumption of teachers from the primary education of Minas Gerais during suspension of face-to-face classes.

## **Materials and methods**

### *Population*

The study population was composed of teachers working in primary education at state schools in the state of Minas Gerais, Brazil and that took part in Projeto ProfSMoc– Etapa Minas Covid (Profs Moc Project – Minas Covid Phase), 2020.

### *Sample planning and inclusion criteria*

For sample calculation, a formula based on the prevalence of disease or event, considering an infinite population (18). A prevalence of 50% was considered in order to obtain a larger sample size and consequently a greater inference power to infer different variables. Tolerable error adopted was 3%. Furthermore, the sample was duplicated ( $D_{eff}=2$ ), since it came from conglomerates. The sample size was increased in 20% to compensate for possible losses (rate of non-respondents) which might compromise the validity of the study. Thus, the need to collect data from 2,564 teachers to ensure the representativeness for the state of Minas Gerais. However, the questionnaire was answered by 15,641 teachers. Of this number, 269 individuals were excluded from the analysis, as they did not meet the study inclusion criteria, totaling a final valid sample of 15,372. Inclusion criteria were regent teachers in the year of 2020, working in the primary education and accepting to take part in the research. The study was approved by Comitê de ética em Pesquisa Envolvendo Seres Humanos (Research Ethics

Committee Involving Human Beings) under protocol n. 4.200.389/2020 and was conducted according to the guidelines of the Helsinki Declaration.

#### *Data collection*

Authorizations and partnerships were obtained from Secretaria de Estado de Educação de Minas Gerais (Secretary of State of Education of Minas Gerais). Data collection occurred from August 20th to September 11th, 2020. Cross-sectional study using online self-applied questionnaire, available for participants through the Google Forms platform and widely circulated by the Secretary of State of Education of Minas Gerais in social media. The questionnaire addressed sociodemographic questions as well as those related to remote working conditions, and food consumption. Teachers signed the written consent form to take part in the research. Anonymity was guaranteed by the platform, not being possible to associate participants' e-mails to their responses. In order to prevent auto fill the research form, a reCAPTCHA test was used thus avoiding that a form was filled by a robot.

Food consumption in this study was measured using a validated food frequency questionnaire (FFQ) used by the telephone survey system for surveillance of risk and protective factors for chronic diseases (Vigitel) of the Ministry of Health, Brazil. Participants were asked about the frequency of their consumption of healthy food: raw or cooked vegetables and legumes, fruits, beans, whole foods (bread, rice, cookies, pasta, whole grains, oats, granola, and flaxseed). And they were also asked about the frequency of their consumption of unhealthy food: processed meats (ham, salami, mortadella, frankfurter, sausage, or hamburger), frozen dishes (pizza, lasagna, etc.), pack snacks, sweets, pies and chocolate, in addition to soft drinks and artificial juices. Dependent variables analyzed were healthy and unhealthy food consumption.

For analysis, responses were recategorized as follows: each group of healthy food receive a score (0 to 4), with 0 as the group with the highest frequency of consumption (every day), 1 (5 to 6 days a week), 2 (3 to 4 days a week), 3 (1 to 2 days a week) and 4 (never or almost never). For each group of food regarded as unhealthy, this score was inverted, so that, the higher the score of each participant, the worse is their diet. For further analysis, a cut-off point was established to represent these two standards of interpretation: above P75 increased consumption of unhealthy foods and below the 75th percentile with

no changes in diet or increased healthy food consumption during the pandemic.

Independent variables included sociodemographic factors, remote working conditions, understanding of online technologies, access to a computer and quality of internet connection. Sociodemographic variables studied were as follows: age (in years: 21 to 40; 41 to 60; 61 or over); gender (male; female) and income (1 to 2 minimum wages; 3 to 5 minimum wages; 5 minimum wages or more). Regarding remote working conditions, the following aspects were assessed: weekly working hours (up to 20 h; 21 to 40 h; 40 h or over); feeling about the teachers' work during the pandemic (satisfied; indifferent; dissatisfied); workload during the pandemic (worked the same amount; worked more; worked less; overworked) and difficulties to teach online (none; a few/moderate; many). The understanding of online technologies was assessed in three categories (excellent/good; regular; poor/terrible). The access to a computer and the quality of internet connection were assessed considering whether the teacher had a computer at home (yes, for personal use; yes, shared with other people; does not have a computer) and the quality of internet connection at home (excellent/good; regular/poor; not available).

#### *Data analysis*

Data were analyzed using descriptive statistics and relative frequencies. The following were considered as independent variables: sociodemographic variables, working conditions, understanding of online technologies, access to a computer and quality of internet connection. Outcome variable was food consumption, dichotomized as healthy or no changes (score up to P75) and unhealthy (score over P75). Chi-square test was performed to check the association between the variable of eating behavior and independent variables. Variables with p-value <0.20 were selected for multiple analysis. In order to estimate the magnitude of the associations, Poisson model with robust variance was used, through the

Prevalence Ratio (PR), at the 0.05 significance level. Poisson regression analysis was performed to assess which variables were predictive of either healthy or unhealthy food consumption during the pandemic. The test of deviance was used in order to evaluate the quality of the adjusted model. All analyses were carried out using the computerized package Statistical Package for the Social Sciences (SPSS), version 20.0.

### Results

The sample was composed of 15,372 participants, with a predominance of females (81.9%). Most aged 40 or older (58.8%) and income from 3 to 5 minimum wages (59.5%). During the pandemic 62.2% of those interviewed worked from 20 to 40 hours per week; 33% were dissatisfied with the remote work and 79.7% reported working more or much more than usual during the pandemic. Regarding computer availability at home, virtually half of the participants (46.7%) shared the computer with other people and 45.6% informed that the quality of their internet connection at home was regular or poor. Regarding food consumption, 20% of teachers had an unhealthy food consumption during the pandemic, 80% did not change their eating habits or had a healthy food consumption (Table 1).

In the bivariate analysis, virtually all variables were seen to be associated with food consumption, except for the following variables: income, understanding of online technologies and computer availability at home (Table 2).

In the adjusted multivariate model analysis, there was a significant association between eating habits and the following variables: gender, age, working hours (per week), feeling about the teachers' work during the pandemic, workload during the pandemic and quality of internet connection. Regarding gender, males had a higher prevalence ratio (PR=1.26; 1.17-1.36) of unhealthy food consumption,

**Table 1.** Sociodemographic characteristics and working conditions of teachers during the COVID-19 pandemic

Variables	n	%
<b>Sociodemographic characteristics</b>		
Gender		
Female*	12817	81.9
Male	2824	18.1
Age		
21 to 40 years*	6447	41.2
41 to 60 years	8793	56.2
60 or older	401	2.6
Income		
1 to 2 min. w.*, a	3969	25.4
3 to 5 min. w.	9301	59.5
5 min. w. or more	2371	15.2
<b>Working conditions</b>		
Working hours (per week)		
Up to 20 h*	4433	28.3
21 to 40 h	9735	62.2
40 h or over	1471	9.4
Feeling about the teachers' work during the pandemic		
Satisfied*	3375	21.6
Indifferent	6995	44.7
Dissatisfied	5271	33.7
Workload during the pandemic		
Worked the same amount*	2143	13.7
Worked more	6755	43.2
Worked less	1037	6.6
Overworked	5706	36.5
Difficulties to teach online during the pandemic		
None*	1472	9.4
A few/moderate	10961	70.1
Many	3208	20.5
Understanding of online Technologies		
Excellent/good*	9840	62.9
Regular	5019	32.1
Poor/terrible	782	5.0
Have a computer at home		
Yes, for personal use*	7757	49.6
Yes, shared with other people	7310	46.7
No	574	3.7
Quality of internet connection at home		
Excellent/good*	8423	53.9
Regular/poor	7126	45.6
Not available	92	0.6
Food consumption		
Healthy or no changes (up to P75) *	12509	80.0
Unhealthy (over P75)	3132	20.0
Total	15641	100.0
Lower than P25	3325	21.0
Between P25 and P50	4821	31.0
Between P50 and P75	4363	28.0
Over P75	3132	20.0

\*reference category. a1 min. w.\* = 198.15 US dollars

**Table 2.** Bivariate analysis of food consumption among teachers during the COVID-19 pandemic.

Independent Variables	Food consumption			P-value
	Healthy n (%)	Unhealthy n (%)	Total n	
Sociodemographic characteristics				
Gender				
Female*	10399(81.1)	2418(18.9)	12817	-
Male	2110(74.7)	714(25.3)	2824	< 0.001
Age (years)				
21 to 40*	4779(74.1)	1668(25.9)	6447	-
41 to 60	7371(83.8)	1422(16.2)	8793	< 0.001
60 or older	3591(89.5)	42(10.5)	401	< 0.001
Income (Minimum wage) <sup>a</sup>				
1 to 2*	3162(79.7)	807(20.3)	3969	-
3 to 5	7459(80.2)	1842(19.8)	9301	0.49
5 or over	1888(79.6)	483(2.4)	2371	0.97
Working conditions				
Working hours (per week)				
Up to 20 h*	3554(80.2)	879(19.8)	4433(100.0)	-
21 to 40 h	7832(80.5)	1903(19.5)	9735(100.0)	0.70
40 h or over	1123(76.3)	348(23.7)	1471(100.0)	0.002
Feelings about the teachers' work during the pandemic				
Satisfied*	2806(83.1)	569(16.9)	3375(100.0)	-
Indifferent	5672(81.1)	1323(18.9)	6995(100.0)	0.01
Dissatisfied	4031(76.5)	1240(23.5)	5271(100.0)	< .001
Workload during the pandemic				
Worked the same amount*	1798(83.9)	345(16.1)	2143(100.0)	-
Worked more	5464(80.9)	1291(19.1)	6755(100.0)	0.002
Worked less	857(82.6)	180(17.4)	1037(100.0)	0.37
Overworked	4390(76.9)	1316(23.1)	5706(100.0)	< .001
Difficulties to teach online during the pandemic				
None*	1218(82.7)	254(17.3)	1472(100.0)	-
A few/moderate	8796(80.2)	2165(19.8)	10961(100.0)	0.03
Many	2495(77.8)	713(22.2)	3208(100.0)	< .001
Understanding of online technologies				
Excellent/good*	7840(79.7)	2000(20.3)	9840(100.0)	-
Regular	4049(80.7)	970(19.3)	5019(100.0)	0.15
Poor/Terrible	620(79.3)	162(20.7)	782(100.0)	0.79
Having a computer at home				
Yes, for personal use *	6168(79.5)	1589(20.5)	7757(100.0)	-
Yes, shared with other people	5880(80.4)	1430(19.6)	7310(100.0)	0.16
No	461(80.3)	113(19.7)	574(100.0)	0.65
Internet quality at home				
Excellent/good*	6819(81.0)	1604(19.0)	8423(100.0)	-
Regular/poor	5617(78.8)	1509(21.2)	7126(100.0)	0.001
Not available	73(79.3)	19(20.7)	92(100.0)	0.69

\*reference category, a1 min. w.\* = 198.15 US dollars

when compared to females. The age of 40 or older was associated with healthy food consumption (PR=0.63; 0.59-0.67) and (PR=0.79; 0.74-0.84), respectively. The following variables were associated with an unhealthy food consumption: working 40 hours a week or over (PR=1.18; 1.06-1.31), dissatisfaction about work (PR=1.26; 1.15-1.39), working more or much more during the pandemic (PR=1.34; 1.21-1.50) and regular or poor internet connection (PR=1.09; 1.02-1.16) (Table 3).

**Table 3.** Poisson Regression for food consumption among teachers during the COVID-19 pandemic

Independent Variables	Unhealthy food consumption		
	Adjusted PR	IC 95%	P-value
Gender			
Female*	1	-	
Male	1.26	1.17-1.36	< 0.001
Age (years)			
21 to 40*	1	-	
41 to 60	0.63	0.59-0.67	< 0.001
60 or older	0.41	0.31-0.55	< 0.001
Working hours (per week)			
Up to 20 h*	1	-	
21 h to 40 h	1.03	0.96-1.11	0.36
40 h or over	1.18	1.06-1.31	0.003
Feelings about the teachers' work during the pandemic			
Satisfied*	1	-	
Indifferent	1.08	0.99-1.19	0.08
Dissatisfied	1.26	1.15-1.39	< 0.001
Workload during the pandemic			
Worked the same amount *	1	-	0.76
Worked less	1.03	0.87-1.21	0.76
Worked more	1.18	1.06-1.31	0.003
Overworked	1.34	1.21-1.50	< 0.001
Quality of internet connection at home			
Excellent/good*	1	-	
Regular/poor	1.09	1.02-1.16	0.008
Not available	1.06	0.71-1.59	0.77

\*reference category - Deviance= 9715.960 P=0.622

## Discussion

Our data has shown that teachers' remote working conditions are associated with a worse food consumption, and that weekly working hours, the feeling of dissatisfaction and the workload during the pandemic, as well as the quality of their internet at home were the variables that correlate with unhealthy food consumption. Several studies have already described changes in eating behavior during the COVID-19 pandemic, which is quite reasonable (15,16,19-22). The stress associated with the coronavirus pandemic, subsequent closing of schools, moving and adapting to homeschooling work, combined with the convenience of easily accessible, palatable, and emotionally comforting foods were reported in another study of school teachers Basic (8). Nevertheless, our study analyzed aspects relating teachers' remote working conditions to their diet for the first time. Studies conducted prior to the pandemic had already identified the absence of data on teachers' and school staff's food consumption and food choices (23). In another context and with different objectives from our study, Dias *et al.* (2020) showed that temporary contract teachers have the worst eating habits (11).

Changes in teachers' eating habits during the COVID-19 pandemic were evaluated in some studies that demonstrated opposite situations, one of them recorded inadequate eating habits (24), the teachers interviewed rarely consumed fruits and vegetables and the other observed a positive change in most eating habits (25). However, literature is still scarce on teachers' working conditions and food consumption, therefore, results from the present study are of great relevance and may guide studies on nutritional intervention with the target population, in order to analyze and better understand whether the working conditions per se may change the food consumption, or trigger feelings and unfavorable eating behaviors. The relationship between stress at work and food choices has been explored and explained through physiological mechanisms, which favor, for example, the consumption of comfort food (high-calorie food, also those

that are rich in carbohydrates and fats) (26,27). Thus, work overload and dissatisfaction with remote work, as potential sources of stress, may shed some light on associations with unhealthy food consumption by participants in this study.

Since professional activities have been online due to the pandemic, interviewed teachers were shown to have difficulties with the quality of their internet at home and their working conditions. These results have been corroborated by other authors who verified similar challenges and issues faced by school teachers during the pandemic, such as difficulties to teach online due to internet connection instability, among other issues (28-30). Mishra *et al.* (28) have also noticed damage to overall health of teachers who have been working online for a long time. In a recent study, Ekpanyasku and Padungtod (31) investigated a magnitude of occupational health problems and lifestyle changes among workers from different companies who started working from home during the pandemic. Irregular food consumption has been identified as one of the lifestyle changes related to the intensity of remote work (22,31).

In the present study, less healthy eating habits were observed among younger teachers. This result is corroborated by others research that considered adults and elderly people more careful and aware of the influence of diet on health (32,33). Remote work during the COVID-19 pandemic did not inaugurate the precarious situation of teaching work, however it brought even more work overload, with a transformation of pedagogical approaches and the need to learn new ways of teaching, situations capable of causing greater dissatisfaction with the work among teachers and impact on behaviors and habits during the pandemic (34)

Since we have seen in the present study associations between remote teaching work conditions and a higher consumption of unhealthy food, it is important to look more closely at the health of such workers. Studies on relations among remote work, food consumption and health of teachers are beginning and there is a need for continuous monitoring of these teachers in the current context and when returning to face-to-face classes (35). Previous researchers have also highlighted the need to adopt public policies aimed at this class of workers, focusing on improvements in working conditions and restructuring strategies to promote health, encouraging preventive measures,

encouraging mainly the regular practice of physical activities and change in eating habits (36-38).

The present study is limited. Among these limitations are the fact that it is a self-applied questionnaire, the fact that it is a cross-sectional study, which limits the causal inference, as well as the assessment of food consumption, which is assessed according to food groups (healthy or unhealthy) and not according to consumption assessment questionnaires such as the 24-hour dietary recall, for example. The strengths of the study are the large sample size and the fact that it is the first to analyze teaching working conditions associated with changes in diet during the COVID-19 pandemic with a representative sample from the state of Minas Gerais, Brazil. It is concluded that remote working conditions during the pandemic influenced basic education teachers' food choices, with working hours and workload, as well as dissatisfaction with remote work and the quality of the internet connection as variables that were associated with unhealthy food consumption. Further studies are required to deepen issues related to both remote and face-to-face teaching working conditions and their implications in their food choices.

#### **Funding details:**

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

#### **Disclosure statement:**

This manuscript has not been submitted to, nor is under review at, another journal or other publishing venue. The authors have no affiliation with any organization with a direct or indirect financial interest in the subject matter discussed in the manuscript.

**Conflict of Interest:** None declared

## References

1. Fialho LMF, Neves VNS. Professores em meio ao ensino remoto emergencial: repercussões do isolamento social na educação formal. *Educ Pesqui.* 2022; 48:e260256. <https://doi.org/10.1590/s1678-4634202248260256por>
2. Garcia RVB, Henklain MHO, Moraes MS, Alves RCM. Ensino Remoto Emergencial: práticas educacionais e percepções docentes. *Educ Real.* 2023; 48: e124612. <https://doi.org/10.1590/2175-6236124612vs01>
3. World Health Organization (PAHO/WHO). Considerations for school-related public health measures in the context of COVID-19 [Internet]. [www.who.int](http://www.who.int). 2020. <https://www.who.int/publications/i/item/considerations-for-school-related-public-health-measures-in-the-context-of-covid-19>
4. Sokal L, Trudel LE, Babb J. Canadian teachers' attitudes toward change, efficacy, and burnout during the COVID-19 pandemic. *Int J Educ Res Open.* 2020; 1:100016. <https://doi.org/10.1016/j.ijedro.2020.100016>
5. König J, Jäger-Biela DJ, Glutsch N. Adapting to online teaching during COVID-19 school closure: teacher education and teacher competence effects among early career teachers in Germany. *Eur J Teach Educ.* 2020;43(4):608–622. <https://doi.org/10.1080/02619768.2020.1809650>
6. Zhang W, Wang Y, Yang L, Wang C. Suspending classes without stopping learning: China's education emergency management policy in the COVID-19 outbreak. *J Risk Financial Manag.* 2020; 13(3):55. <https://doi.org/10.3390/jrfm13030055>
7. Dunfee M, Bush H, Leger KA, Hilbert TJ, Brancato C, Haynes EN. Impact of Implementing New Technology Into K-12 Classrooms on Teacher Well-Being During the COVID-19 Pandemic. *TechTrends.* 2024. <https://doi.org/10.1007/s11528-024-00957-y>
8. Silverman JR, Wang BZ. Impact of school closures, precipitated by COVID-19, on weight and weight-related risk factors among schoolteachers: A cross-sectional study. *Nutrients.* 2021;13(8):2723. <https://doi.org/10.3390/nu13082723>
9. Wong KY, Sulaiman T, Ibrahim A, Kunchi Mohd AG, Hassan Hussin O, Wan Jaafar WM. Secondary school teachers psychological status and competencies in e-teaching during Covid-19. *Heliyon.* 2021;7(11): e08238. <https://doi.org/10.1016/j.heliyon.2021.e08238>
10. Baade JH, Gabiec CE, Carneiro FK, Micheluzz SCP, Meyer PAR. Professores da educação básica no Brasil em tempos de Covid-19. *Holos.* 2020; 5:1–16. <https://doi.org/10.15628/holos.2020.10910>
11. Dias DF, Melanda FN, Santos ESD, Andrade SM, Mesas AE, González AD. Teachers on temporary employment contracts reveal more frequent consumption of pre-prepared food. *Cien Saúde Colet.* 2020;25(7):2645–2652. <https://doi.org/10.1590/1413-81232020257.26372018>
12. Bracale R, Vaccaro CM. Changes in food choice following restrictive measures due to COVID-19. *Nutr Metab Cardiovasc Dis.* 2020;30(9):1423–1426. <https://doi.org/10.1016/j.numecd.2020.05.027>
13. Scardina A, Tabacchi G, Thomas E. *et al.* Relationship between Lifestyle Determinants and Perceived Mental and Physical Health in Italian Nursery and Primary School Teachers after the COVID-19 Lockdown. *J. Funct. Morphol. Kinesiol.* 2024;17;9(1):33. <https://doi:10.3390/jfmk9010033>
14. Górnicka M, Drywień ME, Zielinska MA, Hamułka J. Dietary and lifestyle changes during COVID-19 and the subsequent lockdowns among polish adults: A cross-sectional online survey PLifeCOVID-19 study. *Nutrients.* 2020;12 (8):2324. <https://doi.org/10.3390/nu12082324>
15. Scarmozzino F, Visioli F. Covid-19 and the subsequent lockdown modified dietary habits of almost half the population in an Italian sample. *Foods.* 2020;9 (5):675. <https://doi.org/10.3390/foods9050675>
16. Sidor A, Rzymiski P. Dietary choices and habits during COVID-19 lockdown: Experience from Poland. *Nutrients.* 2020;12 (6):1657. <https://doi.org/10.3390/nu12061657>
17. Durães SA, Pena GC, Nobre LN, Bicalho AH, Silva RRV, Haikal DS, *et al.* Food consumption changes among teachers during the COVID-19 pandemic. *Obes. Med.* 2021; 26:100366. <https://doi.org/10.1016/j.obmed.2021.100366>
18. Triola MF. *Introdução à Estatística.* 10a ed. Rio de Janeiro (Brasil): LTC; 2008.
19. Werneck AO, Silva DR da, Malta DC, Souza-Júnior PRB de, Azevedo LO, Barros MB de A, *et al.* Lifestyle behaviors changes during the COVID-19 pandemic quarantine among 6,881 Brazilian adults with depression and 35,143 without depression. *Cien saude colet.* 2020; 25(Supl.2):4151–6. <https://doi.org/10.1590/1413-812320202510.2.27862020>
20. Fanelli RM. Changes in the Food-Related Behaviour of Italian Consumers during the COVID-19 Pandemic. *Foods.* 2021;10 (1):169. <https://doi.org/10.3390/foods10010169>
21. Błaszczuk-Bębenek E, Jagielski P, Boleślawska I, Jagielska A, Nitsch-Osuch A, Kawalec P. Nutrition behaviors in polish adults before and during COVID-19 lockdown. *Nutrients.* 2020;12(10):3084. <https://doi.org/10.3390/nu12103084>
22. Steele EM, Rauber F, Costa CDS, Leite MA, Gabe KT, Louzada ML, *et al.* Dietary changes in the NutriNet Brasil cohort during the covid-19 pandemic. *Rev Saúde Pública.* 2020; 54:91. <https://doi.org/10.11606/s1518-8787.2020054002950>
23. Hartline-Grafton HL, Rose D, Johnson CC, Rice JC, Webber LS. Are school employee's role models of healthful eating? Dietary intake results from the action worksite wellness trial. *J Am Diet Assoc.* 2009; 109 (9):1548–1556. <https://doi.org/10.1016/j.jada.2009.06.366>



24. Vieira AR, Andrade Junior JLB de, Costa LL. et al. Factors associated with the lifestyle of state basic education teachers of state during the pandemic. *Rev Gaucha Enferm.* 2023; 44: e20230068. <https://doi.org/10.1590/1983-1447.2023.20230068.en>
25. Puścion-Jakubik A, Olechno E, Socha K, Zujko ME. Eating Habits during the COVID-19 Pandemic and the Level of Antibodies IgG and FRAP-Experiences of Polish School Staff: A Pilot Study. *Foods.* 2022; 30;11(3):408. <https://doi.org/10.3390/foods11030408>
26. Park S, Sung E. "You gotta have something to chew on." perceptions of stress-induced eating and weight gain among office workers in South Korea. *Public Health Nutr.* 2021;24(3):499-511. <https://doi.org/10.1017/s1368980020000890>
27. Pena Gralle APB, Barbosa Moreno A, Lopes Juvanhol L. et al. Job strain and binge eating among Brazilian workers participating in the ELSA-Brasil study: does BMI matter? *J Occup Health.* 2017;59(3):247-255. <https://doi.org/10.1539/joh.16-0157-OA>
28. Mishra L, Gupta T, Shree A. Online teaching-learning in higher education during lockdown period of COVID-19 pandemic. *Int J Educ Res Open.* 2020; 1:100012. <https://doi.org/10.1016/j.ijedro.2020.100012>
29. Duarte AWB, Hypolito AM. Docência em tempos de COVID-19: uma análise das condições de trabalho em meio a pandemia. *Retr da Esc.* 2020; 14(30):736-752. <https://doi.org/10.22420/rde.v14i30.1207>
30. Selvaraj A, Radhin V, Ka N, Benson N, Mathew AJ. Effect of pandemic based online education on teaching and learning system. *Int J Educ Dev.* 2021; 85:102444. <https://doi.org/10.1016/j.ijedudev.2021.102444>
31. Ekpanyaskul C, Padungtod C. Occupational Health Problems and Lifestyle Changes Among Novice Working-From-Home Workers Amid the COVID-19 Pandemic. *Saf Health Work.* 2021;12(3):384-389. <https://doi.org/10.1016/j.shaw.2021.01.010>
32. Ordoñez-Araque R, Caicedo-Jaramillo C, García-Ulloa M, Dueñas-Ricaurte J. Eating habits and physical activity before and during the health emergency due to COVID-19 in Quito-Ecuador. *Hum Nutr Metab.* 2021; 24:200122. <https://doi.org/10.1016/j.hnm.2021.200122>
33. Villena-Esponera MP, Moreno-Ortega A, Baquero RA, Ugarte-Gurrutxaga MI, Moreno-Rojas R, Rios-Carmenado I. Covid 19: Eating behavior changes related to individual and household factors during the COVID-19 lockdown in Spain. *Arch Latinoam Nutr.* 2021; 71(1): 13-27. <https://doi.org/10.37527/2021.71.1.002>
34. Silva RRV, Barbosa REC, Silva NSS e. et al. Pandemia da COVID-19: insatisfação com o trabalho entre professores(as) do estado de Minas Gerais, Brasil. *Cien Saude Colet.* 2021; 26(12), 6117-6128. <https://doi.org/10.1590/1413-812320212612.10622021>
35. Souza KR, Santos GB, Rodrigues MAS. et al. Trabalho remoto, saúde docente e greve virtual em cenário de pandemia. *Trab. educ. saúde.* 2021;19: e00309141. <https://doi.org/10.1590/1981-7746-sol00309>
36. Dutra ER, Flório FM, Souza LZ de. Perfil antropométrico e conhecimento nutricional de professores do ensino fundamental. *RBONE.* 2021;15(93):363-373. <https://www.rbone.com.br/index.php/rbone/article/view/1711/1116>
37. Vieira MRM, Magalhães TA, Silva RRV, et al. Arterial Hypertension and work among teachers of basic education in the public-school system. *Cien Saúde Colet.* 2020;25(8):3047-3061. <https://doi.org/10.1590/1413-81232020258.26082018>
38. Parker EA, McArdle PF, Gioia D, Trilling A, Bahr-Robertson M, Costa N, et al. An onsite fitness facility and integrative wellness program positively impacted health-related outcomes among teachers and staff at an urban elementary/middle school. *Glob Adv Health Med.* 2019; 8:2164956119873276. <https://doi.org/10.1177/2164956119873276>

Recibido: 14/02/2024  
Aceptado: 29/03/2024