

Changes in the frequency of oral hygiene during the COVID-19 pandemic among teachers

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Aim: To verify changes in the frequency of oral hygiene among basic education teachers in Minas Gerais during the COVID-19 pandemic, according to gender.

Methods: This is a web survey, epidemiological study. Data collection took place from August to September 2020 through digital form. The dependent variable was the frequency of oral hygiene during the pandemic, categorized as: remained the same, increased, and decreased. Multinomial Logistic Regression was performed.

Results: In this study, 15,641 teachers participated, 81.9% of whom were women. Regarding the frequency of oral hygiene, 73.4% reported that it remained the same, 20.1% increased, and 6.5% decreased, with no significant difference between genders. The chances of a decrease in the frequency of oral hygiene were greater in women under 60 years of age, those without children, those who tested positive for COVID-19, those with a worsening health during the pandemic, those with an increased body weight during the pandemic, and those who were sad or depressed during the pandemic. Among men, the chances of reduction were greater among those who did not live with a spouse, those with a worsening health during the pandemic, those who were sad or depressed during the pandemic, and among smokers or ex-smokers.

Conclusion: Although the prevalence of changes in the frequency of oral hygiene in the pandemic did not differ between men and women, the factors related to the increase and decrease in frequency were different for each sex.

Uniterms: Oral health. Oral hygiene. Occupational health. Coronavirus. Health surveys.

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INTRODUCTION

Oral hygiene habits are essential for maintaining oral health, which in turn constitutes, in all its complexity, an integral and inseparable part of the general health of the human body, providing both positive and negative influences¹. Periodontal disease and tooth loss, which are directly related to oral hygiene, are also linked to pain, psychological constraints, and social deprivation, which negatively impact people's well-being and quality of life².

Several factors contribute to the maintenance of periodontal disease, including stress, depression, and poor nutrient intake³. Social distancing measures and the increased risk factors associated with the COVID-19 pandemic may have affected self-care behaviors and, ultimately, oral hygiene habits^{1,4}.

Adults make up a large proportion of the Brazilian population, and dental care is often needed to treat periodontal disease, carious lesions, and dental pain that can affect one's quality of life and social well-being^{4,5}.

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Among the many professions, there are those in which the mouth is an important work tool. Such is the case with teachers, who depend on it to fully perform their activities^{6,7}. Teachers are often seen as role models to be followed by their students and can even influence the behavior of young people according to their own conduct. In addition, those who spend long periods of time at work seem to have greater difficulty accessing oral health services. Thus, there is an aggravation of the problems that can transform into reasons for absenteeism or presenteeism^{7,8}.

In this context, the notoriety of hygiene habits stands out, associated with several factors, including sociodemographic and economic factors, as well as lifestyle and psychological conditions^{7,9,10}. Oral hygiene habits also follow different patterns between men and women. Previous studies have also shown that women have a greater attendance and health perception than men¹¹. There are a number of factors that contribute to this, including social, cultural, and psychological factors that make women more concerned with esthetics than men, coupled with their responsibilities in society, which may lead to a greater concern for maintaining one's own health¹².

However, it is still unknown how this behavior continued during the COVID-19 pandemic, according to sex. Therefore, this study aimed to verify the changes in the frequency of oral hygiene among teachers in the state of Minas Gerais during the COVID-19 pandemic, stratified by sex.

MATERIALS AND METHODS

STUDY DESIGN, SETTING AND PARTICIPANTS

This work is an epidemiological, cross-sectional, and analytical web survey. Based on the ProfSMoc Project - Minas Covid Stage, this study aimed to assess health conditions at work and associated factors of basic education teachers in public schools in the state of Minas Gerais, Brazil.

In 2020, the state of Minas Gerais (located in the southeast region of Brazil) had approximately 21,292,666 inhabitants, with 853 municipalities. The state education network consisted of around 90,000 teachers working in 3,441 schools. The Minas Gerais State Department of Education (*SEE-MG*) divides the state into six poles and each pole is subdivided into Regional Teaching Superintendencies (*SREs*). In all, the state has 45 *SREs*. As these are web surveys, our study

followed the considerations of the Checklist for Reporting Results of Internet E-Surveys¹³.

Due to the fact that this study was based on a web survey, it was impossible to control the sample size (since the time period in which responses would be received was disclosed). Despite this, a sample calculation was performed with the intention of knowing the minimum *n* necessary to guarantee inference power for the population of teachers in the state of Minas Gerais. Thus, a minimum sample of 2,564 teachers was estimated (infinite populations, 50% prevalence, 3% error, $d_{eff}=2$, and 20% increase) to ensure representativeness for the entire state of Minas Gerais.

As following inclusion criteria were adopted for teachers: working as a teacher in 2020 and working in elementary and/or high school. Retired teachers and those who were working in a position other than the teaching function did not participate in the survey. There was no restriction on participation for those on sick leave.

DATA COLLECTION, INSTRUMENTS, AND STUDY VARIABLES

A pilot study was carried out with 20 teachers from five different cities in Minas Gerais in order to test and adjust the instrument. The instrument did not undergo any significant changes after the pilot study; therefore, the pilot participants were included in the final sample.

Data collection took place from August 20 to September 11, 2020, using a digital form through the Google Forms® platform. The form link was sent by *SEE-MG* to the institutional e-mail of the teachers. To avoid robotic fillings, a reCAPTCHA was used. The study focused on preserving the identity of the participants and filling out the form took approximately 25 minutes, as observed in a pilot study.

The frequency of oral hygiene was adopted as the dependent variable. The variable was presented through the following question: "During this period of social isolation due to the new coronavirus pandemic, it can be stated that your daily oral hygiene practice", with the following answer options: "remained the same", "increased" or "decreased".

The independent variables were divided into two thematic blocks:

Block 1: Sociodemographic and economic characteristics: age, place of work, reduced income during the pandemic, live with a spouse, and have children.

Block 2: Habits and health conditions: COVID-19 risk group (including hypertension, chronic respiratory disease, obesity, diabetes, old age, etc.), adherence to social distancing, tested positive for COVID-19, a family member or friend died by COVID-19, very afraid of COVID-19¹⁴ (validated to the Brazilian population¹⁵), worsening in health during the pandemic, increased body weight during the pandemic, poorer quality of sleep during the pandemic, leisure time during the pandemic, daily computer use during the pandemic, sad or depressed during the pandemic, self-medication during the pandemic, consumption of alcohol during the pandemic, and smoker or ex-smoker. The COVID-19 Fear Scale is a valid instrument that investigates people's fear of COVID-19. The scale presents items that are answered on a Likert-type scale. The total score is obtained from the sum of the items: seven to 19 points (mild fear), 20 to 26 points (moderate fear), and 27 to 35 points (extreme fear). For the present study, "mild fear" and "moderate fear" were organized into a single category, thus observing those who were not very afraid and those who were very afraid of COVID-19.

DATA ANALYSIS

The data from the present study were analyzed using the Statistical Package for Social Sciences (SPSS®), version 22.0. Descriptive data analyses were conducted and stratified by sex. To analyze the factors associated with the frequency of oral hygiene, bivariate analyses were performed using the Pearson chi-square statistical test. In sequence, the variables that presented a descriptive level lower than or equal to 20% were initially selected to compose the multiple models. In the multiple models, the Multinomial Logistic Regression was adopted,

considering the option "remained the same" as the reference category. The models were manually adjusted. All variables that presented $p \leq 0.20$ entered the model together, and were removed one by one, maintaining only the variables with a descriptive level lower than 5% in the final model. Adjusted analyses estimated by Odds Ratio (OR), 95% confidence interval (95% CI), and descriptive level ($p < 0.05$) were presented. The quality of the adjustment of the models was evaluated by the coefficient of determination (Pseudo R^2).

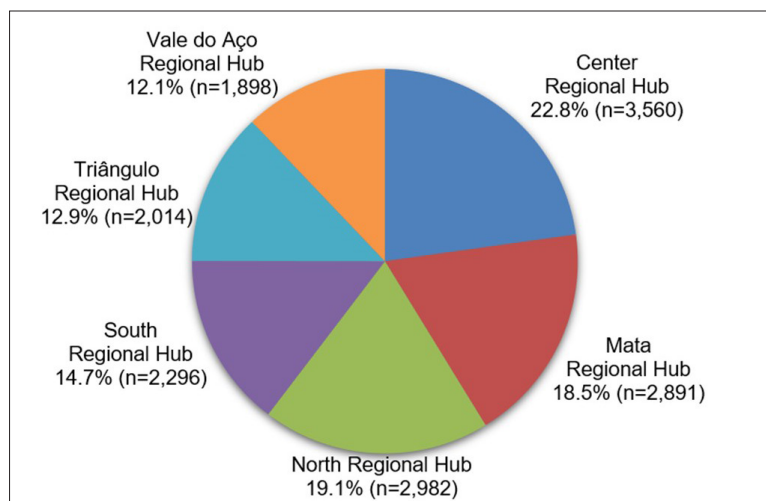
ETHICAL ASPECTS

The project was submitted to the Research Ethics Committee of the State University of Montes Claros (Unimontes) and approved with an embodied report *nr* 4.200.389/2020. All participants received the Informed Consent Form along with the data collection form. This study meets the stipulations set forth in resolution 466/12 of the National Health Council/Ministry of Health, which deals with research with human beings.

RESULTS

A total of 16,210 teachers participated in the survey. Of these, 114 did not agree to participate in the study, and 455 were excluded as they were not working the teaching profession. After exclusions, 15,641 teachers participated, a number about six times greater than that stipulated by the sample calculation, but representing an approximate 18% response rate. Teachers from 93.2% of the cities in Minas Gerais participated in the study, with a smaller representation from the Vale do Aço Regional Hub (12.1%) and the largest participation from the Centro Regional Hub (22.8%) (Figure 1).

Figure 1. Distribution of teachers by regions in the state of Minas Gerais, 2020 (n = 15,641).



Of the total number of participants, 81.9% were female, with an average age of 42.9 (SD = 9.2), 43.4 (SD = 9.0) among women and 40.7 (SD = 10.1) among men; 40.9% showed a decrease in family income; 35.8% belonged to a COVID-19 risk group; 43.7% were very afraid of COVID-19;

and 58% reported increased body weight.

As for the frequency of oral hygiene, 73.4% reported that the frequency remained the same during the pandemic, 20.1% reported an increase and 6.5% a decrease. Figure 2 shows the frequency of oral hygiene stratified by sex.

Figure 2. Frequency of oral hygiene during the COVID-19 pandemic among teachers stratified by sex. Minas Gerais, 2020 (n=15,641).

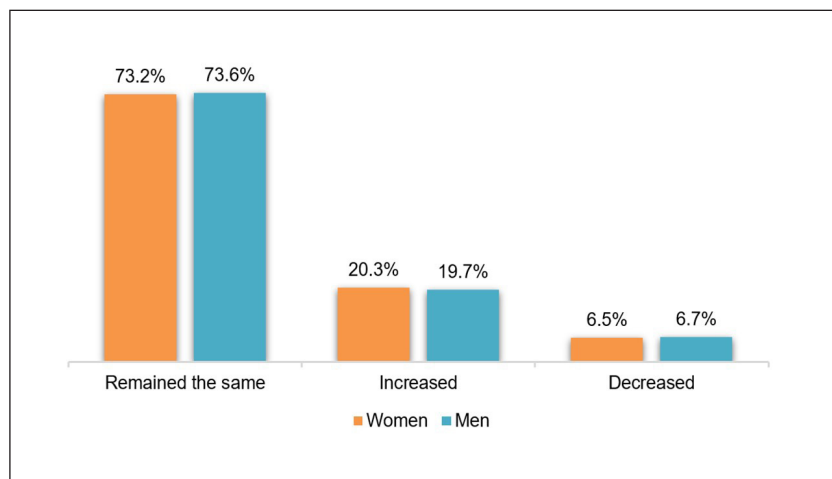


Table 1 presents the results of the bivariate analysis for men and women. The independent variable adherence to social distancing, in relation to females, and the positive test for the

COVID-19 variable, in relation to males, at the 20% level were not associated with the outcome variable. The other association variables were initially selected to compose the multiple model.

Table 1. Bivariate analysis, stratified by sex, of the frequency of oral hygiene among teachers during the COVID-19 pandemic. Minas Gerais, 2020 (n = 15,641).

VARIABLES	Frequency of Oral Hygiene DP							
	Women			p-value*	Men			p-value*
	Remained the same	Increased	Decreased		Remained the same	Increased	Decreased	
n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)		
Sociodemographic and Economic Profile								
Age				0.000				0.056
60 years or more	326 (75.6)	98 (22.7)	7 (1.6)		85 (73.9)	28 (24.3)	2 (1.7)	
Under 60 years	9,062 (73.2)	2,498 (20.2)	826 (6.7)		1,994 (73.6)	527 (19.5)	188 (6.9)	
Workplace				0.000				0.042
Urban Area	8,203 (73.5)	2,194 (19.7)	759 (6.8)		1,785 (74.1)	456 (18.9)	168 (7.0)	
Rural Area	1,185 (71.3)	402 (24.2)	74 (4.5)		294 (70.8)	99 (23.9)	22 (5.3)	
Decrease in DP income				0.000				0.000
No	5,657 (74.9)	1,425 (18.9)	471 (6.2)		1,304 (76.8)	296 (17.4)	98 (5.8)	
Yes	3,731 (70.9)	1,171 (22.2)	362 (6.9)		775 (68.8)	259 (23.0)	92 (8.2)	
Live with a spouse				0.000				0.000
Yes	6,473 (74.3)	1,691 (19.4)	549 (6.3)		1,315 (75.6)	334 (19.2)	91 (5.2)	
No	2,915 (71.0)	905 (22.1)	284 (6.9)		764 (70.5)	221 (20.4)	99 (9.1)	
Have children				0.005				0.002
Yes	7,203 (73.3)	2,022 (20.6)	603 (6.1)		1,147 (75.4)	295 (19.4)	80 (5.3)	
No	2,185 (73.1)	574 (19.2)	230 (7.7)		932 (71.6)	260 (20.0)	110 (8.4)	

Habits and Health Conditions							
COVID-19 risk group				0.093			0.034
Yes	3,371 (72.2)	973 (20.8)	325 (7.0)	645 (70.7)	197 (21.3)	74 (8.0)	
No	6,017 (73.8)	1,623 (19.9)	508 (6.3)	1,425 (75.0)	358 (18.9)	116 (6.1)	
Adherence to social distancing				0.740			0.131
Partially/No	1,639 (72.7)	464 (20.6)	153 (6.8)	673 (74.9)	178 (19.8)	48 (5.3)	
Totally	7,749 (73.4)	2,132 (20.2)	680 (6.4)	1,406 (73.0)	377 (19.6)	142 (7.4)	
Tested positive for COVID-19				0.012			0.930
No	9,276 (73.3)	2,564 (20.3)	813 (6.4)	2,063 (7.6)	551 (19.7)	189 (6.7)	
Yes	112 (68.3)	32 (19.5)	20 (12.2)	16 (76.2)	4 (19.0)	1 (4.8)	
A family member or friend died due to COVID-19				0.003			0.000
No	7,534 (73.9)	2,006 (19.7)	656 (6.4)	1,687 (75.1)	425 (18.9)	134 (6.0)	
Yes	1,854 (70.7)	590 (22.5)	177 (6.8)	392 (67.8)	130 (22.5)	56 (9.7)	
Showed extreme fear of COVID-19				0.000			0.000
No	5,339 (77.3)	1,187 (17.2)	380 (5.5)	1,477 (77.6)	332 (17.4)	95 (5.0)	
Yes	4,049 (68.5)	1,409 (23.8)	453 (7.7)	602 (65.4)	223 (24.2)	95 (10.3)	
Showed a worsening in health status DP				0.000			0.000
No	5,259 (76.0)	1,419 (20.5)	243 (3.5)	1,261 (76.6)	334 (20.3)	51 (3.1)	
Yes	4,129 (70.0)	1,177 (20.0)	590 (10.0)	818 (69.4)	221 (18.8)	139 (11.8)	
Increased body weight DP				0.000			0.000
No	3,799 (74.9)	1,924 (20.2)	248 (4.9)	1,055 (75.8)	270 (19.4)	66 (4.7)	
Yes	5,417 (72.1)	1,528 (20.3)	569 (7.6)	1,013 (71.4)	282 (19.9)	124 (8.7)	
Showed worsening in sleep quality DP				0.000			0.000
No	4,076 (77.2)	991 (18.8)	214 (4.1)	1,098 (77.8)	268 (19.0)	45 (3.2)	
Yes	5,312 (70.5)	1,605 (21.3)	619 (8.2)	981 (69.4)	287 (20.3)	145 (10.3)	
Leisure activities during the pandemic				0.000			0.001
Yes	5,082 (74.6)	1,336 (19.6)	397 (5.8)	1,579 (75.2)	395 (18.8)	125 (6.0)	
No	4,306 (71.7)	1,260 (21.0)	436 (7.3)	500 (69.0)	160 (22.1)	65 (9.0)	
Computer use DP				0.000			0.063
Less than 4 hours per day	951 (77.7)	217 (17.7)	56 (4.6)	256 (77.8)	60 (18.2)	13 (4.0)	
4 hours or more	8,437 (72.8)	2,379 (20.5)	777 (6.7)	1,823 (73.1)	495 (19.8)	177 (7.1)	
Sad or depressed DP				0.000			0.000
Never/Few times	4,955 (76.5)	1,290 (19.9)	233 (3.6)	1,477 (77.8)	360 (19.0)	62 (3.3)	
Often/Always	4,433 (69.9)	1,306 (20.6)	600 (9.5)	602 (65.1)	195 (21.1)	128 (13.8)	
Self-medication DP				0.000			0.000
Yes	4,197 (72.0)	1,079 (18.5)	552 (9.5)	691 (71.3)	176 (18.2)	102 (10.5)	
No	5,191 (74.3)	1,517 (21.7)	281 (4.0)	1,388 (74.8)	379 (20.4)	88 (4.7)	
Alcohol consumption DP				0.000			0.001
Yes	3,536 (73.8)	853 (17.8)	404 (8.4)	1,148 (73.7)	283 (18.2)	127 (8.2)	
No	5,852 (72.9)	1,743 (21.7)	429 (5.3)	931 (73.5)	272 (21.5)	63 (5.0)	
Smoker or ex-smoker				0.003			0.000
No	8,620 (73.6)	2,362 (20.2)	737 (6.3)	1,789 (74.4)	477 (19.8)	138 (5.7)	
Yes	768 (69.9)	234 (21.3)	96 (8.7)	290 (69.0)	78 (18.6)	52 (12.4)	

* Pearson chi-square; 95% CI: 95% Confidence Interval; p-value ≤ 0.05; DP: During the Pandemic

Table 2 presents the final multiple models adjusted by sex. Regarding women, the increase in the frequency of oral hygiene was greater in those who worked in rural areas (OR = 1.25), with a decrease in income (OR = 1.23), and who did not live with a spouse (OR = 1.27), than in those who had a family member/friend who died

from COVID-19 (OR = 1.12), who presented an extreme fear of COVID-19 (OR = 1.52), who reported sleep disorders (OR = 1.13), who used the computer 4 hours or more a day during the pandemic (OR = 1.22), who did not self-medicate (OR=1.20), and who did not consume alcoholic beverages during the pandemic (OR = 1.23). As

for the decrease in the frequency of oral hygiene among women, there was a greater chance of decrease among those under 60 years of age (OR = 3.23), without children (OR = 1.20), who tested positive for COVID-19 (OR = 1.71), who showed a worsening health status (OR = 2.03), who reported increased body weight (OR = 1.19), and who often/always felt sad or depressed during the pandemic (OR = 1.79). However, working in rural areas (OR = 0.69), not self-medicating (OR = 0.57), and not drinking alcohol during the pandemic (OR = 0.74) proved to be protective factors that diminished the frequency of oral hygiene.

Among men, the increase in the frequency of oral hygiene was greater among those working in rural areas (OR = 1.31), with a decrease in family income (OR = 1.45) and who presented an extreme fear of COVID-19 (OR = 1.61). The decrease in the frequency of oral hygiene was greater among those who did not live with a spouse (OR = 1.61), with a worsening health status (OR = 2.40), who felt sad and depressed often/always (OR = 2.67), and among those who were smokers (OR = 1.72). Not practicing self-medication (OR = 0.66) was also a protective factor against reducing the frequency of oral hygiene (Table 2).

Table 2. Adjusted analysis of Multinomial Logistic Regression stratified by sex, with the option having remained the same as the reference category in relation to the frequency of oral hygiene among teachers during the COVID-19 pandemic. Minas Gerais, 2020 (n = 15,641).

VARIABLES	Increased				Decreased			
	Women		Men		Women		Men	
	Adjusted OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Sociodemographic and Economic Profile								
Age								
60 years or more	1		-	-	1		-	-
Under 60 years	0.90 (0.71;1.14)	0.391	-	-	3.23 (1.51;6.90)	0.002	-	-
Workplace								
Urban Area	1		1		1		1	
Rural Area	1.25 (1.10;1.42)	0.000	1.31 (1.01;1.68)	0.036	0.69 (0.53;0.90)	0.006	0.97 (0.60;1.56)	0.905
Decrease in DP income								
No	1		1		1		1	
Yes	1.23 (1.12;1.35)	0.000	1.45 (1.20;1.76)	0.000	1.00 (0.86;1.16)	0.981	1.22 (0.90;1.67)	0.195
Live with a spouse								
Yes	1		1		1		1	
No	1.27 (1.15;1.41)	0.000	1.13 (0.93;1.37)	0.219	1.06 (0.90;1.25)	0.438	1.61 (1.18;2.20)	0.003
Have children								
Yes	1		-	-	1		-	-
No	0.89 (0.79;1.00)	0.053	-	-	1.20 (1.01;1.43)	0.034	-	-
Habits and Health Conditions								
Tested positive for COVID-19								
No	1		-	-	1		-	-
Yes	1.13 (0.76;1.69)	0.536	-	-	1.71 (1.03;2.83)	0.037	-	-
A family member or friend died due to COVID-19								
No	1		-	-	1		-	-
Yes	1.12 (1.01;1.25)	0.028	-	-	0.86 (0.72;1.03)	0.112	-	-
Showed extreme fear of COVID-19								
No	1		1		1		1	
Yes	1.52 (1.38;1.68)	0.000	1.61 (1.30;1.98)	0.000	1.03 (0.88;1.20)	0.705	1.30 (0.93;1.81)	0.113
Showed a worsening in health status DP								
No	1		1		1		1	
Yes	0.91 (0.85;1.01)	0.083	0.85 (0.69;1.05)	0.145	2.03 (1.70;2.43)	0.000	2.40 (1.66;3.47)	0.000
Increased body weight DP								
No	1		-	-	1		-	-
Yes	1.03 (0.94;1.13)	0.422	-	-	1.19 (1.02;1.40)	0.027	-	-

Showed a worsening in sleep quality DP								
No	1	-	-	1	-	-	-	-
Yes	1.13 (1.01;1.26)	0.023	-	-	1.06 (0.88;1.29)	0.507	-	-
Computer use DP								
Less than 4 hours per day	1	-	-	1	-	-	-	-
4 hours or more	1.22 (1.04;1.43)	0.011	-	-	1.18 (0.89;1.58)	0.243	-	-
Sad or depressed DP								
Never/Few times	1	1	1	1	1	1	1	1
Often/Always	0.97 (0.87;1.08)	0.635	1.19 (0.94;1.50)	0.131	1.79 (1.49;2.16)	0.000	2.67 (1.86;3.84)	0.000
Self-medication DP								
Yes	1	1	1	1	1	1	1	1
No	1.20 (1.10;1.32)	0.000	1.13 (0.92;1.40)	0.224	0.57 (0.48;67)	0.000	0.66 (0.48;0.91)	0.011
Alcohol consumption DP								
Yes	1	-	-	1	-	-	-	-
No	1.23 (1.12;1.35)	0.000	-	-	0.74 (0.64;0.86)	0.000	-	-
Smoker or ex-smoker								
No	-	-	1	-	-	-	1	-
Yes	-	-	0.94 (0.72;1.24)	0.707	-	-	1.72 (1.20;2.48)	0.003
Model (Women): Pseudo R²=6.6%								
Model (Men): Pseudo R²=9.5%								

95% CI: 95% Confidence Interval; p-value ≤ 0,05; DP: During the Pandemic.

DISCUSSION

The results of the present study showed that, regarding the frequency of oral hygiene, teachers reported increased hygiene, rather than a decrease, during the pandemic. Although this proportion was quite homogeneous between the sexes, the factors related to the increase and decrease in frequency proved to be different between the sexes. Even with the pandemic affecting the frequency of oral hygiene in a similar way among them, women tend to be more concerned with esthetics and more attentive to health issues⁴.

Regarding age, younger women (under 60 years) showed a decrease in the frequency of oral hygiene, possibly related to the greater inclusion of young women in the work market. Challenges arise in the reconciliation of domestic and work activities, due to the increase in time at home, showing an increase in the level of stress. The presence of damage related to mental and physical health is also possible and justifiable, thus reducing the dedication to self-care^{16,17}. A previous study found that the greater vulnerability of people over 60 years of age to COVID-19 favored the greater concern of women in this age group in relation to health in general, including oral hygiene¹⁸.

Studies have examined the effects of exhaustion experienced by workers in large

urban centers^{8,19}. In this sense, it is understood that an extensive workload on the job leads to greater physical and emotional strain^{8,17}. In the present study, it was observed that teachers, both men and women, who worked in urban areas had a greater chance of decreasing the frequency of oral hygiene. Life/work in the city is often more hectic and, therefore, more stressful when compared to the countryside¹⁹. In addition, most of these teachers started to work remotely, performing more functions, which could lead to a decrease in the frequency of oral hygiene in those workers in the urban area when compared to those in the rural area, where the pandemic may have changed the way of life. Furthermore, the expansion of domestic activities and the increase in the need for assistance in the children's school activities led to intense exhaustion and, in effect, demotivation for hygiene habits¹⁷.

The decrease in family income was associated with an increase in the frequency of oral hygiene in both sexes. Its reduction may have increased the fear of the need to use dental services, especially paid ones. A decrease in the frequency of oral hygiene was also observed among women who did not have children and an increase among those who lived with a spouse. Taking into account historical issues, for a long time, women have been placed in a position of the primary caregiver in the home²⁰. Also considering the maternal instinct and attention, teachers with

children tend to demand more in the sense of maintaining unaltered hygiene habits as a way to ensure encouragement and a good example to their children. Women, in general, have a greater sense of self-care in relation to oral health when compared to men, who commonly show concern when the problem reaches greater proportions, interfering with daily and work tasks^{4,17}. Living with a spouse was associated with a higher frequency of hygiene among women, possibly because they are more concerned with good oral esthetics and good health and hygiene conditions than are those who were not living with a spouse and who showed a decrease in the frequency of hygiene.

The teachers who self-reported having tested positive for COVID-19 had a decrease in the frequency of oral hygiene. This can be related to the impacts of symptoms caused by the virus, such as tiredness and discouragement. Those with a family member or friend who died due to COVID-19 showed an increase in oral hygiene. This result is most likely due to the impacts of the loss reflected on both emotions and the increased fear of contagion, which could become a motivation for the redoubling of health care^{21,22}. Likewise, it was observed that fear of the disease more often favored the adoption of oral hygiene habits. This result was similar to findings from Nery et al.²², in which, due to the COVID-19 pandemic, participants reported increased use of some hygiene products.

Teachers with worse sleep quality during the pandemic had an increased frequency of oral hygiene, possibly due to stress, anxiety, and fear¹⁷. As already discussed, the greatest fear of COVID-19 is associated with the increased frequency of cleaning, possibly with the aim of preventing contamination and reducing the need to seek care²³. On the other hand, teachers who were sadder and more depressed showed a decrease in the frequency of oral hygiene. It is well-known that social distancing shed light on symptoms related to loneliness, such as a loss of interest in daily activities, discouragement, and a feeling of incapacity²⁴.

Teachers, both men and women, who showed a worsening in their health status during the pandemic, had a decrease in the frequency of oral hygiene. It is possible that, with the worsening of physical and/or mental health conditions, the attention given to oral health can be diverted. Thus, the consequences of social distancing investigated in other studies also address an increase in stress, work overload, and discouragement, in addition to the reduction in physical exercise and leisure practices, which

are essential for full health promotion^{25,26}.

Teachers who reported increased body weight showed a decrease in the frequency of oral hygiene. The increase in sedentary behavior, added to tiredness, can contribute to an increase in body weight and lead to greater neglect with oral care²⁵.

It is believed that the increase or decrease in self-care habits occurs together, even if in different areas/aspects of health, such as changes in eating habits, weight gain, and a worsening health status^{26,27}. The increased consumption of unhealthy foods during the pandemic, such as those with high sugar, fat, and/or salt levels, contributes to oral diseases^{3,26}. Such foods are well accepted, are practical, and are usually associated with excessive consumption. Due to social isolation, access to these foods was facilitated, and their consumption was consequently increased. In addition to the association between ultra-processed foods and oral diseases, such as dental caries, one can also observe the close relationship among diseases, such as being overweight, diabetes, and obesity²⁸.

The use of the computer for a greater number of hours per day was associated with an increase in the frequency of oral hygiene among teachers, although in a previous study, the increase in the use of screens is related to the worsening of their health status²⁴. In this sense, it can be thought that teachers, during the pandemic, developed a greater concern with oral health, taking better care of hygiene habits due to the greater frequency of food consumption outside the main meals, including moments of relaxation, such as watching TV.

Male teachers who were former or current smokers had a greater chance of decreasing the frequency of oral hygiene. Among women, there was an increase in the frequency of oral hygiene among those who did not consume alcohol during the pandemic. Smoking and drinking habits are related to the individual's psychological state and can be aggravated in situations of stress or anxiety¹⁰. The concomitant use of these two substances is a potential risk factor for the emergence of oral cancer and other pathologies²⁷.

This research has some limitations that should be considered, such as the possibility of selection and memory bias. Another limitation is related to the higher number of women, since this is a comparison study between genders. However, this is representative of the population, in which women occupy a larger share in basic education teacher positions. Moreover, the

analyses performed showed the difference in the percentage of sexes. The strengths of this study include: the *SEE-MG* partnership, the inclusion of teachers from all *SREs*, the robustness of the sample, and the representativeness of 13.3% of teachers working in rural areas.

CONCLUSION

It was observed that 26% of the teachers studied experienced changes in the frequency of oral hygiene during the pandemic. In both sexes, deterioration of physical and mental health was associated with a decrease in the frequency of oral hygiene, while an increased fear of COVID-19 was associated with an increase in this frequency.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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Mudanças na frequência de higiene bucal durante a pandemia da COVID-19 entre professores

Introdução: Cuidar da higiene bucal é fundamental para a manutenção da saúde.

Objetivo: Verificar as mudanças na frequência de higienização bucal entre professores durante a pandemia da COVID-19, segundo sexo.

Métodos: Trata-se de um estudo transversal, do tipo *websurvey*, realizado com professores da educação básica pública de Minas Gerais. A coleta de dados ocorreu em 2020. A variável dependente foi a frequência de higiene bucal durante a pandemia. Foi realizada Regressão Logística Multinomial.

Resultados: Participaram do estudo 15.641 professores, sendo 81,9% mulheres. Em relação à frequência de higiene bucal, 73,4% relataram que permaneceu a mesma, 20,1% aumentou e 6,5% diminuiu, sem diferença significativa entre os sexos. As chances de diminuição da frequência de higienização bucal foram maiores em mulheres com menos de 60 anos, sem filhos, que testaram positivo para a COVID-19, com piora da saúde durante a pandemia, com aumento de peso corporal durante a pandemia e aquelas que estavam tristes ou deprimidas durante a pandemia. Entre os homens, as chances de redução foram maiores entre aqueles que não moravam com cônjuge, com piora da saúde durante a pandemia, aqueles que estavam tristes ou deprimidos durante a pandemia e entre os fumantes ou ex-fumantes.

Conclusão: A frequência de higienização bucal na pandemia não apresentou diferenças significativas entre os sexos, no entanto, observou-se, em ambos os sexos, que variáveis referentes às características sociodemográficas, hábitos de vida e condições de saúde, foram associados ao aumento e diminuição da frequência de higienização bucal na pandemia.

Descritores: Saúde bucal. Higiene bucal. Saúde do trabalhador. Coronavírus. Inquéritos epidemiológicos.