Quality of life in dentistry students in the Pandemic of COVID-19: a multicentric study

Qualidade de vida em estudantes de odontologia na Pandemia de COVID-19: um estudo multicêntrico

Cinthia Nara Gadelha Teixeira[1], Maria Imaculada de Queiroz Rodrigues[2], Raul Anderson Domingues Alves da Silva[3], Paulo Goberlânio Barros Silva[4], Myrna Maria Arcanjo Frota Barros[5]

[1] PhD. Professor of the Dentistry course at the University of Fortaleza (UNIFOR), Fortaleza (CE), Brazil; [2] Dentist surgeon. Master's student in Dentistry at the Postgraduate Program in Dentistry (PPGO), Federal University of Ceará (UFC), Fortaleza (CE), Brazil; [3] Masters. PhD student in Dentistry at the Postgraduate Program in Dentistry (PPGO), Federal University of Ceará (UFC), Fortaleza (CE), Brazil; Professor of the Dentistry course at the Centro Universitário Católica de Quixadá (UNICATÓLICA), Quixadá (CE), Brazil; [4] PhD. Professor of the Dentistry course at Centro Universitário Christus (UNICHRISTUS), Fortaleza (CE), Brazil; [5] PhD. Professor of the Dentistry Course at the Federal University of Ceará (UFC), Campus Sobral (CE), Brazil.

***Corresponding author:** Raul Anderson Domingues Alves Silva- E-mail: raulanderson_alves@hotmail.com*

ABSTRACT

This study aimed to assess the quality of life (QOL) of dental students in the 2019 Coronavirus Disease pandemic (COVID-19). A cross-sectional study was carried out with undergraduate students in Dentistry from Higher Education Institutions (HEIs) in the state of Ceará, Brazil. Data collection took place in May 2020, online, using questionnaires with sociodemographic, course-related and behavioral variables, in addition to the World Health Organization Questionnaire for Quality of Life-bref (WHOQOL-bref). Multinomial logistic regression was performed. 864 students participated in this study. Variables such as higher income ($p = 0.034$), having religion ($p = 0.010$), having health insurance ($p = 0.005$), satisfaction with sleep quality ($p < 0.001$), absence of insomnia ($p < 0.001$) and practicing physical activity always ($p < 0.001$) were associated with greater satisfaction regarding QOL. The QoL of dental students was classified in the dissatisfaction category, being perhaps impacted by the pandemic of COVID-19. Variables that reflected a more economically favorable living condition were associated with satisfaction with the quality of life of this public in the COVID-19 pandemic.
Keywords: Coronavirus infections. Dental students. Pandemics. Quality of life.

RESUMO

O objetivo deste estudo foi avaliar a qualidade de vida (QV) de estudantes de Odontologia de Instituições de Ensino Superior (IES) do Estado do Ceará, Brasil, na pandemia de *Coronavirus Disease* 2019 (COVID-19). O método utilizado foi um estudo transversal, e a coleta de dados ocorreu em maio de 2020, *online*, por meio de questionários com variáveis sociodemográficas, as relacionadas ao curso e as comportamentais, além do *World Health Organization Questionnaire for Quality of Life-bref* (WHOQOL-bref). Foi realizada regressão logística multinomial. Participaram 864 estudantes. Variáveis como maior renda ($p = 0,034$), possuir religião ($p = 0,010$), possuir plano de saúde ($p = 0,005$), satisfação com a qualidade do sono ($p < 0,001$), ausência de insônia ($p < 0,001$) e praticar atividade física ($p < 0,001$) foram associadas à maior satisfação quanto à QV. A QV dos estudantes foi classificada insatisfatória, talvez impactada pela COVID-19. Variáveis que refletiram uma condição de vida mais favorável economicamente estiveram associadas à satisfação com a qualidade de vida desse público na pandemia.
Palavras-chaves: Estudantes de odontologia. Infecções por Coronavírus. Pandemias. Qualidade de vida.

INTRODUCTION

On December 31, 2019, China reported to the World Health Organization (WHO) the discovery of a new disease, originating in Wuhan, then named Coronavirus Disease 2019 (COVID-19), caused by a new type of Coronavirus, Sars- CoV-2[1]. With the rapid advance of the disease worldwide, due to its high rate of contagion, on March 11, 2020, WHO declared COVID-19 as a pandemic[2]. No cure yet and no vaccine available against the new virus, social distancing has been adopted worldwide as a measure to contain the spread of the disease, in order to flatten the contagion curve and prevent the collapse of national health systems[3, 4].

In situations like these, in which the individual right is suppressed due to collective well-being[4], it is of fundamental importance to understand how the population faces this scenario, and how it impacts their quality of life. A study noted that the population reported post-traumatic symptoms and increased stress in the family and at work after the epidemic of Severe Acute Respiratory Syndrome (SARS)[5], a disease also caused by a type of Coronavirus, which mainly affected the population of Hong Kong in China in 2003.

Some studies on the impact of the current pandemic on the lives of the world population are already being developed in several countries. In China, a good portion of the participants revealed to be horrified and apprehensive during the pandemic[6]. In Spain, a study also showed higher levels of stress and anxiety in participants, after the reinforcement of the isolation in the country, in relation to the start of the epidemic[7].

In this same perspective, the quality of life (QoL) of university students has also been the target of research interest. This public seems to be directly affected, as shown by a study carried out in Guangdong, China, where anxiety and depression rates above 20% were observed in the sample studied[8].

Undergraduate programs in Dentistry are characterized by a high level of stress for students[9]. In the first years of the program, which is configured as the pre-clinical period, there is a high theoretical load, which includes basic concepts for dental practice and development of clinical skills necessary for professional activity[10], in addition to the competition for increasingly higher grades that is established within classes, and the fear of failure to meet so many demands[11]. In a recent literature review, significant levels of stress were identified in undergraduate students in Dentistry from both public and private higher education institutions (HEIs), which greatly impacted their QoL, associating with the development of psychological disorders and worsening academic performance[12].

Thus, investigating how the pandemic moment has a real impact on the quality of life of dental students is urgent and necessary, including for HEIs to set strategies that effectively help these students to face this situation. Thus, this study aimed to assess the QoL of dental students in the pandemic of COVID-19.

METHODOLOGY

An observational, cross-sectional study was conducted with undergraduate students in Dentistry from Higher Education Institutions (HEIs) in the state of Ceará.

The following HEIs participated in the study: Federal University of Ceará (UFC), campus Fortaleza and Sobral, both public, in addition to the private HEIs University of Fortaleza (Unifor) and Catholic University Center of Quixadá (Unicatólica). The institutions were included because they have the longest running programs in Dentistry in Ceará, with more than 10 years, in addition to being located in different regions of the state.

Students regularly enrolled in the undergraduate program in Dentistry of the participating HEIs were included, excluding those who were in leave of absence of studies. For the sample calculation, the number of students duly enrolled in the 2020.1 academic period was considered, being 1,861 (UFC/Fortaleza-415; UFC/Sobral-252; Unifor-844; and Unicatólica-350). Based on ignorance of the impact of

COVID-19 on the quality of life of undergraduate students (p=0.5), adopting a 95% confidence and an accuracy of 5%, and considering the total number of students enrolled in each of the HEIs, it was estimated necessary to evaluate 200, 153, 265, and 184 students, from the respective UFC/Fortaleza, UFC/Sobral, Unifor, and Unicatólica institutions, totaling a minimum sample of 802 students.

Data collection took place from May 19 to 25, 2020, online, maintaining the anonymity of the participants. Online data collection was used to recruit data due to the social isolation required by the pandemic, where activities, when carried out, took place remotely. The coordinators of the programs involved, faculty and some students, contributed to the dissemination of the questionnaire to students. Data were collected by completing sociodemographic, course-related and behavioral information, in addition to the semi-structured and self-administered QoL questionnaire, the World Health Organization Questionnaire for Quality of Life-bref (WHOQOL-bref).

Sociodemographic information involved: gender (male/female); age (≤20 years/>20 years); self-declared race (white/black/brown/yellow/indigenous); marital status (single/married or living together); having children (no/yes); having job (no/yes); family monthly income, in minimum wages (MW) (no income/1-2MW/3-6MW/>6MW); having religion (no/yes); living with (parents/other family members/spouse/alone/friends/others); and having a health plan (no/yes). Information related to the program included: HEI where is attending Dentistry (UFC Fortaleza/UFC Sobral/Unifor/Unicatólica); and grade in Dental school (1st/2nd/3rd/4th/5th). Regarding behavioral information, students were asked about: sleep quality (fully satisfied/reasonably satisfied/dissatisfied); insomnia (often/sometimes/not at all); physical activity (always/sporadically/rarely/never); leisure time during the days of the week (no leisure/1 time/2 to 3 times/4 times or more); smoking (sometimes/always/do not smoke); and drinking alcohol (sometimes/always/do not drink).

The WHOQOL-bref is a self-reported, cross-cultural instrument for measuring QOL, translated and validated in Brazil. To complete it, participants were instructed to consider the fifteen days prior to the application of the instrument. It contains 26 questions, each of which has five Likert-type options, ranging from 1 (nothing/very, bad/never) to 5 (extremely/completely/very good/always). The first two questions are general, while the others are divided into four domains: Physical (seven questions), Psychological (six questions), Social Relations (three questions) and Environment (eight questions)[13].

The dependent variable in this study was QoL, which was measured using WHOQOL-bref scores. In the analysis, the scores obtained were transformed into a linear scale, which ranged from 0 to 100, these being, respectively, the least and most favorable values of QoL, according to the syntax proposed by the WHOQOL-group[13]. This variable was associated with the independent variables, represented by sociodemographic information, related to the Dental school and behavioral variables.

Then, the students were categorized as "dissatisfied" and "satisfied" regarding their QoL, taking as a cut-off point values below and above 70, respectively, from the WHOQOL-bref questionnaire, adapted[14], to expose the absolute and percentage frequency. All variables were analyzed using Fisher's exact test or Pearson's chi-square test, and a multinomial logistic regression model was designed to independently check the factors linked to QoL.

The internal consistency of the WHOQOL-bref questionnaire, item-by-item and domain-by-domain, was evaluated by calculating Cronbach's alpha and all of these items were correlated with the general score, using Spearman's correlation. The Friedman/Dunn test was used to compare the domains.

Data were exported to the software Statistical Package for the Social Sciences (SPSS) version 20.0 for Windows®, in which the analyses were run adopting a 95% confidence interval.

The study was approved by the National Research Ethics Committee, under Opinion 4,032,230,

on May 18, 2020. Before applying the questionnaire, it was suggested to read the Informed Consent Form (ICF), on a link available for access, according to Resolution 466/2012 of the National Health Council[15].

RESULTS

The 1,861 students regularly enrolled in the participating HEIs were invited to participate in the study. Of these, 997 did not respond to the questionnaires, and there was no refusal. Thus, 864 dentistry undergraduate students participated in this study, in which Unifor was the most prevalent HEI (32.6%), due to a greater number of responses. Among the participants, there was a predominance of females (69.1%), those over 20 years of age (65.2%), and self-declared whites (45.8%). The highest prevalence was single

(95.3%), and those without children (95.8%); 92.4% did not work, and the most prevalent monthly family income was 3 to 6 minimum wages (40.2%), and 76.7% said they lived with their parents. When asked about religion, 81.8% said they had one; 52% reported not having health insurance. Among students, 24.8% were at the fifth grade of Dental School. Most considered themselves reasonably satisfied with sleep (49.5%), and the same proportion reported having insomnia at times. Physical activity was reported to be performed rarely (36.2%). Leisure was described 2 to 3 times a week (33.6%), and once on the weekend (49.8%). The vast majority said they did not smoke (95%) and 63.5% reported always drinking alcohol (Table 1).

Table 1. Descriptive analysis of the variables of Dentistry undergraduate students, according to the Higher Education Institution (HEI)

(To be continued)

| Variables | | IES | | | | |
| | | Public | | Private | | |
	Total	UFC Fortaleza	UFC Sobral	Unifor	Unicatólica	p-value
Total	864 (100.0%)	229 (100.0%)	167 (100.0%)	282 (100.0%)	186 (100.0%)	-
Sex						
Male	267 (30.9%)	71 (31.0%)	61 (36.5%)	74 (26.2%)	61 (32.8%)	0.130
Female	597 (69.1%)	158 (69.0%)	106 (63.5%)	208 (73.8%)	125 (67.2%)	
Age						
Up to 20 years	301 (34.8%)	70 (30.6%)	64 (38.3%)	77 (27.3%)	90 (48.4%)*	*<0.001*
>20 years	563 (65.2%)	159 (69.4%)*	103 (61.7%)*	205 (72.7%)*	96 (51.6%)	
Color						
White	396 (45.8%)	77 (33.6%)	69 (41.3%)	180 (63.8%)*	70 (37.6%)	*<0.001*
Black	49 (5.7%)	21 (9.2%)	7 (4.2%)	5 (1.8%)	16 (8.6%)	
Brown	395 (45.7%)	126 (55.0%)*	83 (49.7%)*	92 (32.6%)	94 (50.5%)*	
Yellow	21 (2.4%)	4 (1.7%)	6 (3.6%)	5 (1.8%)	6 (3.2%)	
Indigenous	3 (0.3%)	1 (0.4%)	2 (1.2%)	0 (0.0%)	0 (0.0%)	
Marital status						
Single	823 (95.3%)	219 (95.6%)	160 (95.8%)	269 (95.4%)	175 (94.1%)	0.859
Married/Living together	41 (4.7%)	10 (4.4%)	7 (4.2%)	13 (4.6%)	11 (5.9%)	

(To be continued)

Variables	Total	IES				p-value
		Public		**Private**		
	Total	**UFC Fortaleza**	**UFC Sobral**	**Unifor**	**Unicatólica**	**p-value**
Children						
No	828 (95.8%)	226 (98.7%)	159 (95.2%)	269 (95.4%)	174 (93.5%)	0.060
Yes	36 (4.2%)	3 (1.3%)	8 (4.8%)	13 (4.6%)	12 (6.5%)	
Job						
No	798 (92.4%)	214 (93.4%)	155 (92.8%)	263 (93.3%)	166 (89.2%)	0.346
Yes	66 (7.6%)	15 (6.6%)	12 (7.2%)	19 (6.7%)	20 (10.8%)	
Income (MW)						
No income	10 (1.2%)	2 (0.9%)	1 (0.6%)	6 (2.1%)	1 (0.5%)	*<0.001*
1-2 MW	311 (36.0%)	74 (32.3%)	96 (57.5%)*	40 (14.2%)	101 (54.3%)*	
3-6 MW	347 (40.2%)	101 (44.1%)*	58 (34.7%)	115 (40.8%)*	73 (39.2%)	
>6 MW	196 (22.7%)	52 (22.7%)	12 (7.2%)	121 (42.9%)*	11 (5.9%)	
Religion						
No	157 (18.2%)	63 (27.5%)*	33 (19.8%)*	41 (14.5%)	20 (10.8%)	*<0.001*
Yes	707 (81.8%)	166 (72.5%)	134 (80.2%)	241 (85.5%)*	166 (89.2%)*	
Living with						
Parentes	663 (76.7%)	179 (78.2%)	136 (81.4%)*	202 (71.6%)	146 (78.5%)*	*0.002*
Other Family members	73 (8.4%)	23 (10.0%)*	9 (5.4%)	28 (9.9%)*	13 (7.0%)	
Spouse	36 (4.2%)	7 (3.1%)	4 (2.4%)	15 (5.3%)	10 (5.4%)	
Alone	43 (5.0%)	12 (5.2%)	3 (1.8%)	22 (7.8%)	6 (3.2%)	
Friends	29 (3.4%)	5 (2.2%)	8 (4.8%)	5 (1.8%)	11 (5.9%)	
Others	20 (2.3%)	3 (1.3%)	7 (4.2%)	10 (3.5%)	0 (0.0%)	
Health Insurance						
No	449 (52.0%)	106 (46.3%)	128 (76.6%)*	73 (25.9%)	142 (76.3%)*	*<0.001*
Yes	415 (48.0%)	123 (53.7%)*	39 (23.4%)	209 (74.1%)*	44 (23.7%)	
Grade						
1st	168 (19.4%)	42 (18.3%)	46 (27.5%)*	30 (10.6%)	50 (26.9%)*	*<0.001*
2nd	149 (17.2%)	51 (22.3%)*	31 (18.6%)	29 (10.3%)	38 (20.4%)*	
3rd	173 (20.0%)	54 (23.6%)	32 (19.2%)	62 (22.0%)	25 (13.4%)	
4th	160 (18.5%)	36 (15.7%)	28 (16.8%)	67 (23.8%)	29 (15.6%)	
5th	214 (24.8%)	46 (20.1%)	30 (18.0%)	94 (33.3%)*	44 (23.7%)	
Sleep quality						
Fully satisfied	178 (20.6%)	56 (24.5%)*	31 (18.6%)	56 (19.9%)	35 (18.8%)	*0.019*
Reasonably satisfied	428 (49.5%)	117 (51.1%)*	84 (50.3%)*	122 (43.3%)	105 (56.5%)*	
Dissatisfied	258 (29.9%)	56 (24.5%)	52 (31.1%)	104 (36.9%)*	46 (24.7%)	

(Conclusion)

Variables	Total	IES				p-value
		Public		Private		
		UFC Fortaleza	UFC Sobral	Unifor	Unicatólica	
Insomnia						
Frequently	316 (36.6%)	76 (33.2%)	52 (31.1%)	123 (43.6%)*	65 (34.9%)	*0.026*
Sometimes	397 (45.9%)	109 (47.6%)*	91 (54.5%)*	116 (41.1%)	81 (43.5%)	
Not at all	151 (17.5%)	44 (19.2%)	24 (14.4%)	43 (15.2%)	40 (21.5%)*	
Physical activity						
Always	175 (20.3%)	43 (18.8%)	28 (16.8%)	69 (24.5%)	35 (18.8%)	0.446
Sporadically	287 (33.2%)	82 (35.8%)	57 (34.1%)	86 (30.5%)	62 (33.3%)	
Rarely	313 (36.2%)	80 (34.9%)	68 (40.7%)	93 (33.0%)	72 (38.7%)	
Never	89 (10.3%)	24 (10.5%)	14 (8.4%)	34 (12.1%)	17 (9.1%)	
Week leisure						
No leisure/week	195 (22.6%)	38 (16.6%)	48 (28.7%)	51 (18.1%)	58 (31.2%)*	*<0.001*
Once a week	250 (28.9%)	51 (22.3%)	61 (36.5%)*	72 (25.5%)	66 (35.5%)*	
2 to 3 times/week	290 (33.6%)	94 (41.0%)*	46 (27.5%)	102 (36.2%)	48 (25.8%)	
4 times or more/week	129 (14.9%)	46 (20.1%)*	12 (7.2%)	57 (20.2%)*	14 (7.5%)	
Weekend leisure						
No leisure/weekend	117 (13.5%)	30 (13.1%)	31 (18.6%)*	23 (8.2%)	33 (17.7%)*	*<0.001*
Once a weekend	430 (49.8%)	103 (45.0%)	95 (56.9%)*	126 (44.7%)	106 (57.0%)*	
More than once/weekend	317 (36.7%)	96 (41.9%)*	41 (24.6%)	133 (47.2%)*	47 (25.3%)	
Smoking						
On some occasions	10 (1.2%)	0 (0.0%)	0 (0.0%)	7 (2.5%)	3 (1.6%)	0.132
Always	33 (3.8%)	9 (3.9%)	5 (3.0%)	12 (4.3%)	7 (3.8%)	
Do not smoke	821 (95.0%)	220 (96.1%)	162 (97.0%)	263 (93.3%)	176 (94.6%)	
Drinking						
On some occasions	27 (3.1%)	3 (1.3%)	0 (0.0%)	21 (7.4%)	3 (1.6%)	*<0.001*
Always	549 (63.5%)	137 (59.8%)	99 (59.3%)	194 (68.8%)*	119 (64.0%)*	

Legend: HEI-Higher Education Institution; MW-Minimum Wage;

*p<0.05, Fisher's exact test or Pearson's chi-square (n, %).

Table 2 lists the association between variables and QoL scores. Dentistry undergraduate students were classified in the category of dissatisfaction as to QoL (59.6%). There was a significant association of the following sociodemographic variables with QoL: work (p=0.046), family income (p<0.001), religion (p=0.003) and health insurance (p<0.001). Those who study Dentistry at UFC/Sobral (69%) and those who are in the 3rd grade of the program (62%) had the highest prevalence of dissatisfaction with QoL, with a significant association between the variable HEI and QoL (p=0.011). The variables sleep quality (p<0.001), insomnia (p<0.001), physical activity (p<0.001), in addition to weekly (p <0.001) and weekend (p <0.001) leisure were also significant when associated with QoL.

Table 2. Association of variables with WHOQOL-bref scores

(To be continued)

Variables	WHOQOL-bref		p-value
	≤ 70	> 70	
Total	**515 (59.6%)**	**349 (40.4%)**	**-**
Sex			
Male	147 (28.5%)	120 (34.4%)	0.068
Female	368 (71.5%)	229 (65.6%)	
Age			
Up to 20 years	168 (32.6%)	133 (38.1%)	0.097
>20 years	347 (67.4%)	216 (61.9%)	
Color			
White	221 (42.9%)	175 (50.1%)	0.056
Black	30 (5.8%)	19 (5.4%)	
Brown	244 (47.4%)	151 (43.3%)	
Yellow	17 (3.3%)	4 (1.1%)	
Indigenous	3 (0.6%)	0 (0.0%)	
Marital status			
Single	487 (94.6%)	336 (96.3%)	0.245
Married/Living together	28 (5.4%)	13 (3.7%)	
Children			
No	495 (96.1%)	333 (95.4%)	0.613
Yes	20 (3.9%)	16 (4.6%)	
Job			
No	468 (90.9%)	330 (94.6%)*	*0.046*
Yes	47 (9.1%)*	19 (5.4%)	
Income (MW)			
No income	6 (1.2%)	4 (1.1%)	*<0.001*
1-2 MW	218 (42.3%)*	93 (26.6%)	
3-6 MW	206 (40.0%)	141 (40.4%)	
>6 MW	85 (16.5%)	111 (31.8%)*	
Religion			
No	110 (21.4%)*	47 (13.5%)	*0.003*
Yes	405 (78.6%)	302 (86.5%)*	
Total	**515 (59.6%)**	**349 (40.4%)**	**-**
Living with			
Parents	382 (74.2%)	281 (80.5%)	0.421
Other Family members	49 (9.5%)	24 (6.9%)	
Spouse	24 (4.7%)	12 (3.4%)	
Alone	29 (5.6%)	14 (4.0%)	
Friends	18 (3.5%)	11 (3.2%)	
Others	13 (2.5%)	7 (2.0%)	

(Conclusion)

Variables	WHOQOL-bref		p-value
	≤ 70	> 70	
Health Insurance			
No	298 (57.9%)*	151 (43.3%)	***<0.001***
Yes	217 (42.1%)	198 (56.7%)*	
HEI			
UFC Fortaleza	138 (26.8%)*	91 (26.1%)	***0.011***
UFC Sobral	116 (22.5%)*	51 (14.6%)	
Unifor	151 (29.3%)	131 (37.5%)*	
Unicatólica	110 (21.4%)	76 (21.8%)*	
Grade			
1st	95 (18.4%)	73 (20.9%)	0.795
2nd	86 (16.7%)	63 (18.1%)	
3rd	108 (21.0%)	65 (18.6%)	
4th	95 (18.4%)	65 (18.6%)	
5th	131 (25.4%)	83 (23.8%)	
Sleep quality			
Fully satisfied	61 (11.8%)	117 (33.5%)*	***<0.001***
Reasonably satisfied	233 (45.2%)	195 (55.9%)*	
Dissatisfied	221 (42.9%)*	37 (10.6%)	
Insomnia			
Frequently	258 (50.1%)*	58 (16.6%)	***<0.001***
Sometimes	209 (40.6%)	188 (53.9%)*	
Not at all	48 (9.3%)	103 (29.5%)*	
Physical activity			
Always	57 (11.1%)	118 (33.8%)*	***<0.001***
Sporadically	179 (34.8%)*	108 (30.9%)	
Rarely	215 (41.7%)*	98 (28.1%)	
Never	64 (12.4%)*	25 (7.2%)	
Week leisure			
No leisure/week	138 (26.8%)*	57 (16.3%)	***<0.001***
Once a week	164 (31.8%)*	86 (24.6%)	
2 to 3 times/week	159 (30.9%)	131 (37.5%)*	
4 times or more/week	54 (10.5%)	75 (21.5%)*	
Weekend leisure			
No leisure/weekend	93 (18.1%)*	24 (6.9%)	***<0.001***
Once a weekend	274 (53.2%)*	156 (44.7%)	
More than once/weekend	148 (28.7%)	169 (48.4%)*	
Smoking			
On some occasions	5 (1.0%)	5 (1.4%)	0.584
Always	327 (63.5%)	222 (63.6%)	
Do not smoke	175 (34.0%)	113 (32.4%)	

Legend: WM-Minimum Wage;

*p<0.05, Fisher's exact test or Pearson's chi-square (n, %).

Table 3. Adjusted analysis of variables with satisfaction with QoL

(To be continued)

Variables	p-value	Adjusted OR (95% CI)
WHOQOL-bref > 70		
Sex (Male)	0.082	1.38 (0.96-1.97)
Age (≤ 20 years)	0.404	1.38 (0.96-1.97)
Color (White)	0.479	1.38 (0.96-1.97)
Marital status (single)	0.949	1.38 (0.96-1.97)
Children (yes)	0.190	1.88 (0.73-4.84)
Job (no)	0.054	1.91 (0.99-3.67)
Income (>2MW)	*0.034	*1.51 (1.03-2.22)*
Religion (yes)	*0.010	*1.83 (1.16-2.90)*
Living with the parents (yes)	0.406	1.20 (0.78-1.85)
Health insurance (yes)	*0.005	*1.75 (1.19-2.57)*
HEI (UFC-Fortaleza)	0.233	1.35 (0.82-2.22)
HEI (UFC-Sobral)	0.053	1.65 (0.99-2.75)
HEI (Unifor)	0.786	1.07 (0.65-1.78)
HEI (Unicatólica)	1.000	1.01 (0.12-12.10)
Grade (4th or 5th)	0.510	1.14 (0.77-1.71)
Sleep quality (satisfied)	*<0.001	*4.07 (2.61-6.36)*
Insomnia (no)	*<0.001	*3.21 (2.16-4.77)*
Physical activity (always)	*<0.001	*3.55 (2.35-5.38)*
Week leisure (2 times or more/week)	0.066	1.40 (0.98-1.99)
Weekend leisure (more than once/weekend)	0.973	1.01 (0.72-1.41)
Smoking (yes)	0.987	1.01 (0.47-2.18)
Drinking (yes)	0.939	1.01 (0.71-1.45)

Legend: MW-Minimum Wage; HEI-Higher Education Institution.
*p<0.05, multinomial logistic regression; OR = Odds ratio; 95% CI = 95% confidence interval of the adjusted OR.

After adjusted analysis, table 3 lists that higher income (p=0.034), having religion (p=0.010), having health insurance (p=0.005), satisfaction with sleep quality (p = <0.001), absence of insomnia (p= <0.001) and always practicing physical activity (p= <0.001) were the factors that were associated with greater satisfaction regarding QoL in dentistry students.

When evaluating Cronbach's α values, to check the internal validity of the construct, a high value was observed. When considering the questions of the WHOQOL-bref, an α = 0.845 was found for all questions, and values above 0.800 for individual questions. For the WHOQOL-bref domains, α = 0.836 was found, when all were considered, and individual values above 0.700 in all. Excluding any of the items or domains of the WHOQOL-bref, the value of α did not decrease to values below 0.700, which means that the questionnaire used in this study showed excellent internal validity (Table 4).

The question of the WHOQOL-bref that most impacted quality of life was 19: How satisfied are you with yourself? (r=0.711). The Environment domain had the highest mean value (68.65±12.50), and the lowest was verified in the Psychological domain (63.56±12.97). However, the Psychological domain was the one that most influenced students' QoL (r=0.834), while Social Relations, which had the least impact (r=0.681) (Table 4).

Table 4. Analysis of internal validity and correlation of WHOQOL-bref questions and domains

(To be continued)

Questions/ Domains WHOQOL-bref	Mean±SD	Cronbach α	Correlation with WHO-QOL-bref
Question by question analysis			
Question 1	3.89±0.79	0.833[a]	p<0.001 (r = 0.606)[c]
Question 2	3.48±0.92	0.837[a]	p<0.001 (r = 0.587)[c]
Question 3	2.26±1.06	0.863[a]	p<0.001 (r = -0.393)[c]
Question 4	2.02±1.00	0.861[a]	p<0.001 (r = -0.390)[c]
Question 5	3.33±0.84	0.835[a]	p<0.001 (r = 0.573)[c]
Question 6	3.85±0.93	0.836[a]	p<0.001 (r = 0.584)[c]
Question 7	2.84±0.77	0.838[a]	p<0.001 (r = 0.530)[c]
Question 8	3.03±0.86	0.835[a]	p<0.001 (r = 0.605)[c]
Question 9	3.35±0.92	0.838[a]	p<0.001 (r = 0.444)[c]
Question 10	2.93±0.85	0.835[a]	p<0.001 (r = 0.630)[c]

Questions/ Domains WHOQOL-bref	Mean±SD	Cronbach α	Correlation with WHO-QOL-bref
Question by question analysis			
Question 11	3.13±0.99	0.837[a]	p<0.001 (r = 0.508)[c]
Question 12	3.11±0.93	0.838[a]	p<0.001 (r = 0.463)[c]
Question 13	3.99±0.81	0.839[a]	p<0.001 (r = 0.450)[c]
Question 14	3.06±1.00	0.835[a]	p<0.001 (r = 0.538)[c]
Question 15	4.19±0.92	0.837[a]	p<0.001 (r = 0.496)[c]
Question 16	2.92±1.10	0.836[a]	p<0.001 (r = 0.584)[c]
Question 17	2.85±1.06	0.832[a]	p<0.001 (r = 0.686)[c]
Question 18	2.75±1.03	0.834[a]	p<0.001 (r = 0.611)[c]
Question 19	2.95±0.99	0.831[a]	p<0.001 (r = 0.711)[c]
Question 20	3.42±1.01	0.834[a]	p<0.001 (r = 0.608)[c]
Question 21	3.00±1.27	0.839[a]	p<0.001 (r = 0.485)[c]
Question 22	3.62±0.99	0.838[a]	p<0.001 (r = 0.452)[c]
Question 23	3.93±0.96	0.836[a]	p<0.001 (r = 0.497)[c]
Question 24	3.29±1.08	0.838[a]	p<0.001 (r = 0.453)[c]
Question 25	3.69±1.14	0.837[a]	p<0.001 (r = 0.485)[c]
Question 26	3.05±1.12	0.869[a]	p<0.001 (r = -0.534)[c]
All questions		0.845[b]	
Domain by domain analysis			
Physical Domain	66.72±13.25	0.792[a]	p<0.001 (r=0.825)[c]
Psychological Domain	63.56±12.97	0.777[a]	p<0.001 (r=0.834)[c]
Social Relations Domain	66.90±16.49	0.829[a]	p<0.001 (r=0.681)[c]
Environment Domain	68.65±12.50	0.817[a]	p<0.001 (r=0.764)[c]
All domains	67.14±10.66	0.836[b]	

[a] Cronbach's alpha value if the item is deleted; [b] Cronbach's alpha value of the construct;

[c] Spearman correlation; *Domain 5 had scores significantly higher than the others (Friedman/Dunn test).

DISCUSSION

Dentistry students were classified in the category of dissatisfaction as to QoL, which differs from a study carried out a few years ago with students from these same HEIs[16]. This result may reflect the social distancing recommended for the control of the pandemic, reducing the possibility of new infections[4], which happened abruptly to the population and to the students, with the face-to-face classes interrupted since mid-March[17]. Allied to this, it is possible that there is a strong fear of these students about the high rate of contagion of COVID-19 by Dentistry professionals[18], being at the top of the ranking of professions, which tends to generate insecurity, and sometimes even fear, regarding the return to academic activities, especially clinics. A higher prevalence of students who participated in this study was aged over 20 years, which can also explain this dissatisfaction with the QoL found, because in a recent survey conducted with adults in the state of Ceará, individuals aged 20 to 39 years considered having a high risk of infection with COVID-19[19], a perception that can impact QoL.

Students attending Dental school in private HEIs had a lower percentage of QoL dissatisfaction, when compared to those attending public HEIs, corroborating a study already conducted in these HEIs[20(16)]. This can be explained by the continuity of academic activities, remotely, by private HEIs, as soon as the interruption of face-to-face activities was decreed and social isolation was decreed. The same did not happen in public schools, with students until June 2020, the month in which this article was written, with the academic calendar paralyzed or with sporadic remote activities, and with a predicted resumption of academic activities in the short term, but also remotely. The literature also shows that students from public HEIs had higher rates of stress and physical and mental exhaustion, mainly due to the level of demand for these students[20], which can directly impact their QoL.

Students who were at the third grade of Dental school had the highest prevalence of dissatisfaction with QoL, a result that may be explained by the fear of

returning to academic activities. Generally, it is in this grade of the program that undergraduate students are starting clinical activities, not yet having complete control over the work process that involves the profession, which can generate greater insecurity regarding biosafety procedures and handling of instruments. The literature points out that in the third grade of the program there is evidence of the accumulation of stress from previous years, in addition to a greater workload and increased responsibility associated with the clinical phase of the program, in which there is direct care for patients[10-11]. Thus, these students may feel unprepared to perform clinical intervention in patients infected with a new virus, like many professionals, as it is an emerging infection and there are no well-established clinical protocols or treatments yet [21].

In this study, students with higher family income were more satisfied with the quality of life during the COVID-19 pandemic. Higher income tends to generate greater security in terms of resources for adopting preventive measures to COVID-19, such as hand hygiene, the use of 70% gel alcohol, in addition to the purchase of medicines, allowing them a lesser chance to get the infection[22].

Students who claimed to have some religion were in the region of satisfaction as for QoL, which can be justified by the fact that spirituality and religiosity are associated with greater satisfaction of QoL[23]. The belief that the problem they are facing is temporary, as well as that their faith in something divine protects them, can be determining factors in this association with better QoL levels.

Having health insurance was a variable that determined greater satisfaction regarding the QoL of the students analyzed. Although Brazil has a public and universal health system[24], it still does not provide an adequate structure in order to meet a great demand concomitantly, which could leave many individuals without health care in a pandemic. Having a health plan would tend to provide greater security in terms of health care, especially in times of global pandemic.

Satisfaction with the quality of sleep and absence of insomnia were significant variables with greater satisfaction of the QoL of dental students. As already mentioned, private HEIs investigated provided adequate remote lessons, while in the public institutions, they were still officially paralyzed. This could provide students with a better night's sleep, despite the pandemic that surrounds them. In addition, there is no need to start activities in the early hours of the day to go to the HEI, since it is already evident in the literature that classes in the morning shift are associated with sleep disorders[25].

Practicing physical activity has always been associated with higher QoL among Dentistry undergraduate students. In pandemic times, staying active and productive has not been an easy task. However, among the factors that contribute to the population's QoL is physical activity, with physical exercise being a low-cost intervention, which can promote health in several aspects when consciously performed[26].

This study has as strengths the fact that it is an unprecedented work, because it evaluated the QoL of undergraduate students in Dentistry in the midst of the pandemic of COVID-19, through a multicenter study. In addition, it will help professors, HEI managers and researchers to see the QoL of undergraduate dentistry students beyond the limits of institutions, requiring a holistic look. Nevertheless, it has as limitations, the non-follow-up of participants over time, as it was a cross-sectional study, which also made it impossible to infer causality; the inability to infer data for the Brazilian population; in addition to collecting data online, which could lead to a possible information bias.

CONCLUSION

The QoL of dentistry undergraduate students was classified in the dissatisfaction category, being perhaps impacted by the pandemic of COVID-19. Sociodemographic and behavioral variables that reflected a more economically favorable life condition were associated with satisfaction with the quality of life of this public in the pandemic of COVID-19.

REFERENCES

1. Hsu LY, Chia PY, Lim JF. The novel coronavirus (SARS-CoV-2) epidemic. Ann Acad Med Singapore 2020; 49(3):105-107.

2. Alharbi A, Alharbi S, Alqaidi S. Guidelines for dental care provision during the COVID-19 pandemic. The Saudi Dental Journal 2020 32(4):181–186.

3. Shuja KH, Aqeel M, Jaffar A, Ahmed A. COVID-19 Pandemic and Impending Global Mental Health Implications. Psychiatr Danub 2020; 32(1):32-35.

4. Wilder-Smith A, Freedman DO. Isolation, quarantine, social distancing and community containment: pivotal role for old-style public health measures in the novel coronavirus (2019-nCoV) outbreak. J Travel Med 2020; 27(2):taaa020.

5. Lau JT, Yang X, Pang E, Tsui HY, Wong E, Wing YK. SARS-related perceptions in Hong Kong. Emerg Infect Dis 2005; 11(3):417-424.

6. Zhang Y, Ma ZF. Impact of the COVID-19 Pandemic on Mental Health and Quality of Life among Local Residents in Liaoning Province, China: A Cross-Sectional Study. Int J Environ Res Public Health 2020; 17(7):2381.

7. Ozamiz-Etxebarria N, Dosil-Santamaria M, Picaza-Gorrochategui M, Idoiaga-Mondragon N. Niveles de estrés, ansiedad y depresión en la primera fase del brote del COVID-19 en una muestra recogida en el norte de España. Cad. Saúde Pública 2020; 36(4):e00054020.

8. Chang J, Yuan Y, Wang D. Mental Health Status and Its Influencing Factors Among College Students During the Epidemic of COVID-19. Nan Fang Yi Ke Da Xue Xue Bao 2020; 40(2):171-176.

9. Ersan N, Fisekçioglu E, Dölekoglu S, Oktay I; Ilgüy D. Perceived sources and levels of stress, general self-efficacy and coping strategies in clinical dental students. Psychol Health Med 2017; 22(10):1175-85.

10. Atalayin C, Balkis M, Tezel H, Onal B, Kayrak G. The prevalence and consequences of burnout on a group of preclinical dental students. Eur J Dent 2015; 9(3):356-63.

11. Aboalshamat K, Hou XY, Strodl E. Psychological well-being status among medical and dental students in Makkah, Saudi Arabia: a cross-sectional study. Med Teach 2015; 37(3):S75-81.

12. Rodrigues MI, Frota LMA, Frota MMA, Teixeira CNG. Fatores de estresse e qualidade de vida de estudantes de Odontologia. Revista da ABENO 2019; 19(1):49-57.

13. Fleck MPA, Louzada S, Xavier M, Chachamovich E, Vieira G, Santos L, Pinzon V. Application of the Portuguese version of the abbreviated instrument of quality life WHOQOL-bref. Rev Saude Publica 2000; 34(2):178-83.

14. Teixeira CNG, Rodrigues MIQ, Silva PGB, Frota MMA, Almeida MEL. Quality of lifeos postgraduate students stricto sensu in dentistry and sociodemographic factors. Rev Odontol UNESP 2017; 46(5):278-283.

15. Brasil. Resolução nº 466, de 12 de dezembro de 2012. Dispõe sobre diretrizes e normas regulamentadoras de pesquisas envolvendo seres humanos. Diário Oficial [da] República Federativa do Brasil, Brasília, DF, 2013; 13 jun.

16. Brito DP, Oliveira LMR, Braga SR, Nuto SAS, Viana FAC. Avaliação da qualidade de vida de acadêmicos de Odontologia do estado do Ceará. Coleç Pesqui Educ Fís 2012; 11(3):41-50.

17. Governo do Estado do Ceará. Decreto nº 33.519, de 19 de março de 2020. Intensifica as medidas para enfrentamento da infecção humana pelo novo coronavírus. Diário Oficial do Estado do Ceará, CE, 2020; 19 mar.

18. Lima YO, Costa DM, Souza JM. Risco de Contágio por Ocupação no Brasil. Impacto COVID-19, Rio de Janeiro, 26 de Mar. de 2020. https://impactocovid.com.br (acesso em 06/Abr/2020)

19. Lima DLF, Dias AA, Rabelo RS, Cruz ID, Costa SC, Nigri FMN, Neri JR. Covid-19 in the State of

Ceará: behaviors and beliefs in the arrival of the pandemic. Ciênc. saúde coletiva 2020; 25(5): 1575-1586.

20. Mafla AC, Villa-Torres L, Polychronopoulou A, Polanco H, Moreno-Juvinao V, Parra-Galvis D, et al. Burnout prevalence and correlates amongst Colombian dental students: the STRESSCODE study. Eur J Dent Educ 2015; 19(4):242-50.

21. Huang JZ, Han MF, Luo TD, Ren AK, Zhou XP. Mental health survey of 230 medical staff in a tertiary infectious disease hospital for COVID-19. Zhonghua Lao Dong Wei Sheng Zhi Ye Bing Za Zhi 2020; 38:E001.

22. Lenzi L, Wiens A, Grochocki MH, Pontarolo R. Study of the relationship between socio-demographic characteristics and new influenza A (H1N1). Braz J Infect Dis 2011; 15(5):457-461.

23. Murakami R, Campos CJG. Religião e saúde mental: desafio de integrar a religiosidade ao cuidado com o paciente. Rev Bras Enferm 2012; 65(2):361-67.

24. Brasil. Constituição (1988). Constituição da República Federativa do Brasil: promulgada em 5 de outubro de 1988.

25. Carone CMM, Silva BDP, Rodrigues LT, Tavares OS, Carpena MX, Santos IS. Fatores associados a distúrbios do sono em estudantes universitários. Cad. Saúde Pública 2020; 36(3):e00074919.

26. Silva RS, Silva I, Silva RA, Souza L, Tomasi E. Atividade física e qualidade de vida. Ciência & Saúde Coletiva, 2010; 15(1):115-120.