


Chapter 10

Burnout in oral and maxillofacial surgeons in Brazilian population during the COVID-19 pandemic: A critical analysis

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ABSTRACT

The training and activities of an oral and maxillofacial surgeon, although stimulating, motivating, and

satisfactory, are not exempt from technical and psychological challenges. Residency training programs aim to develop the necessary skills of resistance and rational decision-making under pressure in clinical, outpatient, and complex hospital interventions. Furthermore, these programs also require the fulfillment of activities outside the operating room, such as issuing diagnoses and planning high-complexity procedures with a high risk of complications. This study aimed to evaluate the levels of burnout in attending surgeons and residents from oral and maxillofacial surgery residency programs located in the State of Ceará, Brazil, during the SARS-CoV-2 (COVID-19) disease pandemic. This observational, cross-sectional study with a quantitative approach was conducted on attending surgeons and residents registered at the Regional Council of Dentistry – Ceará Section. Data were obtained through an online questionnaire with three sets of questions: 1) professional factors; 2) the Oldenburg Burnout Inventory instrument; and 3) sociodemographic aspects. Quantitative data were analyzed with the Statistical Package for Social Science software. Nonparametric statistical analysis (Fisher and Kruskal-Wallis Exact tests) was used, in addition to the Chi-square test, adopting a significance level of 5%. A sample of 78 participants was obtained, in which most attendings (58.7%) and residents (40%) demonstrated moderate levels of burnout. We can conclude that the levels of burnout in oral and maxillofacial attending surgeons and residents from the State of Ceará during the COVID-19 pandemic were moderate, not resulting in high levels of emotional exhaustion and depersonalization.

Keywords: Psychological burnout, Oral and Maxillofacial Surgeons, Oral Surgery, Occupational Health, Brazil.

1 INTRODUCTION

Oral and Maxillofacial Surgery (OMFS) is an oral medicine specialty that encompasses professional training for several types of health service provision, such as in-and outpatient as well as on-call services, carrying out complex surgical procedures (LaPorta, 2010; AlKindi et al., 2020).

In Brazil, a dental surgeon who aspires to become an OMFS specialist must enter a residency program, which aims to develop not only technical skills related to surgical precision but also to improve the handling of cognitive and anxiety symptoms for rational decision-making, especially in high complexity interventions with a high risk of complications. Moreover, OMFS residents must also participate in planning procedures, diagnostic evaluations, and other activities outside the operating room, aggravating the already intense workload (AlKindi et al., 2020).

Therefore, the advanced training of an OMFS resident requires full dedication work as it involves an active methodology governed by direct clinical care, theoretical classes, tutoring, and research activities that must often be carried out in person and strategically. This reality forces attending surgeons and residents to seek professional fulfillment in all activities through hard daily work, which may cause chronic fatigue, emotional exhaustion, psychological stress, and depersonalization when the expectations are not properly managed (Divaris et al., 2012; Shapiro, Rao, Dean, & Salama, 2017; Raftopoulos et al., 2019).

The duties of an OMFS surgeon are challenging, as they require intellectual and administrative skills, decision-making authority, high complexity tasks, such as managing urgencies and emergencies, and high overall demand with extensive working hours and a great number of patients. The OMFS specialty demands resoluteness, precision, efficiency, and effectiveness while also requiring empathetic handling of patients with physical and emotional distress, extreme pain, traumatic injuries, and disfiguring tumors, in addition to the risk of death (LaPorta, 2010; AlKindi et al., 2020).

The Coronavirus Disease 2019 (COVID-19) pandemic has created considerable challenges to the health care systems and professionals as a result of the rapid spread of the infection and the high number of affected patients. The OMFS staff, as healthcare professionals, are not immune to the devastating psychological effects of the COVID-19 pandemic (Amin, Austin, Roser, & Abramowicz, 2021).

Consequently, this new scenario drastically affected health residency programs, which are heavily based on in-person practices, leading to a decline in surgical procedures and prompting other activities such as theoretical classes, tutoring, and research to be conducted remotely. The overall surgical practice was reduced, especially elective procedures (Bhalla et al., 2021; Santos, Silva, Caracas, & Melo 2021).

Burnout Syndrome (BS) is evidenced by a triad of interrelated psychological feelings: emotional exhaustion, depersonalization and cynicism, and decreased sense of personal accomplishment with work (Maslach & Jackson, 1981).

Although some relevant findings regarding the development of BS in OMFS professionals worldwide have been reported, there is a paucity of information on the effects prompted by the COVID-19 pandemic in the State of Ceará, Brazil. Thus, this study aimed to assess the levels of BS in attending

surgeons and residents of OMFS residency programs located in the State of Ceará during the COVID-19 pandemic.

2 METHODOLOGY

2.1 STUDY DESIGN

This observational, cross-sectional, and quantitative study was conducted on attending surgeons and residents from OMFS residency training programs in the State of Ceará. The recommendations for observational research proposed by the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) initiative were followed (Von Elm et al., 2008).

2.2 CONTEXT

This study complied with all ethical principles of research involving human beings, meeting the requirements of the National Research Ethics Commission. Ethical approval for this study was obtained from the Human Research Ethics Committee of the Paulo Picanço School of Dentistry, following Resolution No. 466 of the National Health Council under reference (No. 4,362,398).

Between February and March 2021, a questionnaire assessing the levels of professional exhaustion was applied to attending and residents of OMFS residency programs in the State of Ceará.

2.3 PARTICIPANTS, INCLUSION, AND EXCLUSION CRITERIA

The inclusion criteria for the study were attending surgeons and residents from OMFS residency training programs in the State of Ceará. Other professionals who did not fit into either of those categories were excluded. As it was a convenience sample (non-probabilistic), only individuals who agreed to participate when invited by signing an informed consent form were included, resulting in a sample of 78 participants.

2.4 VARIABLES

The two core dimensions of BS, according to the Oldenburg Burnout Inventory (OLBI) (Sinval, Queirós, Pasian, & Marôco, 2019) (figure 1), were considered as variables: emotional exhaustion and disengagement. Professional factors and sociodemographic characteristics were also evaluated.

2.5 DATA SOURCES

Data from the present study were acquired through a survey questionnaire on *Google Forms* made available online through a link sent via *WhatsApp messenger*.

Bias

Measures are taken to avoid potential sources of bias (Hammer, Du Prel, & Blettner, 2009):

a) Participant recruitment mechanism: although participation was voluntary, participants received three messages via *WhatsApp messenger*: 1) Welcome and introduction to the survey; 2) Questionnaire (link to the online questionnaire platform) and 3) A message expressing gratitude for the participation in the survey;

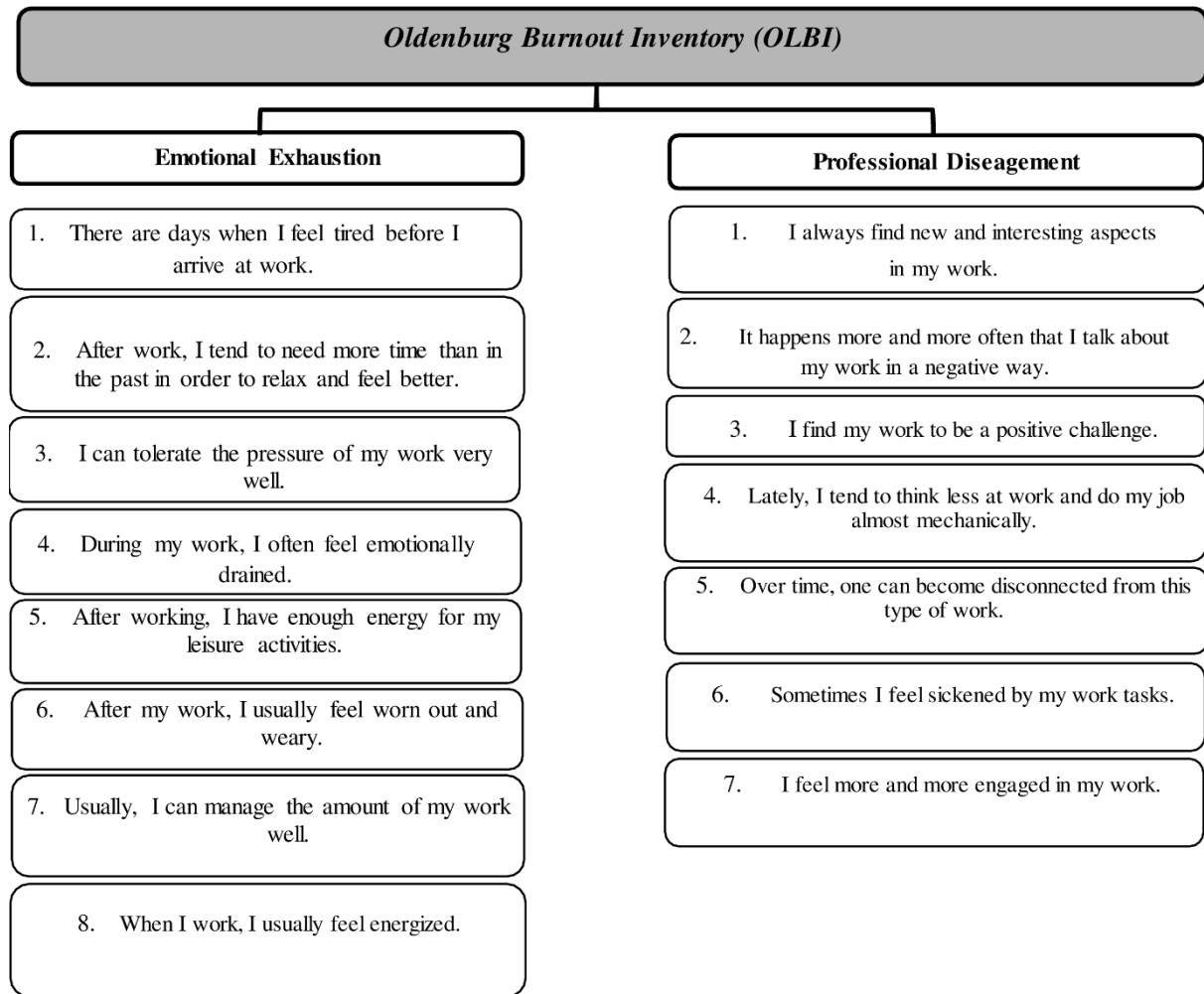
b) Information bias: the survey was conducted through the free and online platform *Google Forms* to avoid interviewer bias and maintain the social distance recommended by the health authorities (Organization WH, 2019). Furthermore, questions about distant events that would require memory recall were avoided.

c) Confusion bias: the authors' intent with the research was not exposed to the participants in any circumstance.

Study Size

We sought to achieve several 99 OMFS attending and 22 OMFS residents with active registration at the Regional Council of Dentistry of the State of Ceará. However, only 68 attendings and 10 residents agreed to participate, amounting to a total of 78 professionals.

Figure 1: OLBI diagram for the assessment of emotional exhaustion and professional disengagement validated for Brazil and Portugal by Sinval, Queirós, Pasian, and Marôco, 2019.



Likert-scale with scores (1 - 5 points) according to the items:

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Source: Diagram prepared by the author.

2.6 QUANTITATIVE VARIABLES

Participants answered the online questionnaire with the quantitative variables listed in the following order:

Questions about the professional aspects of working as an OMFS attending surgeon: 1) Hours worked per week; 2) Number of patients seen per day; 3) Working at a public or private hospital; 4) Working at a hospital in the state capital (Fortaleza) or other regions of the state; 5) Last vacation period; 6) Balancing personal and life; 8) Impact of income on financial and personal needs. Questions about the professional aspects of working as an OMS resident: 1) Hours worked per week; 2) Number of patients seen per day; 3) Residency at a public or private hospital; 4) Residency at a hospital in the state capital (Fortaleza) or other regions of the state; 5) Last vacation period; 6) Balancing personal and professional life; 8) Impact of income on financial and personal needs; 9) Year of residence; 10) Communication with the responsible supervisor to report exhaustion.

The OLBI, originally elaborated by Demerouti and Nachreiner in 1998, has undergone several modifications since its original 25-item structure publication (Demerouti & Nachreiner, 1998). Its current English language version consists of 16 items, and its Portuguese translation received cross-cultural validation for Brazil and Portugal by Sinval, Queirós, Pasian, and Marôco in 2019, with a questionnaire containing 15 items based on a Likert scale, ranging from 1 = strongly disagree to 5 = strongly agree. This scale aims to measure professional exhaustion in diverse fields, with questions addressing emotional exhaustion and professional disengagement (Sinval, Queirós, Pasian, & Marôco, 2019).

The OLBI Emotional Exhaustion Factor subscale covers cognitive, physical, and affective aspects and characteristics, consisting of eight items related to the feeling of emptiness, work overload, and need for rest, and physical, cognitive, and emotional exhaustion. The disengagement factor subscale consists of seven items, referring to distancing and disconnection from work, along with negative and cynical behaviors and attitudes towards work (Figure 1).

To test its construct validity, a factor analysis with the main components, establishing a 2-factor extraction, was performed. The Kaiser-Mayer-Olkin KMO test = 0.83 and Bartlett's test of sphericity ($\chi^2(105) = 573.760$, $p < 0.001$) were considered satisfactory. Factor 1, called Emotional Exhaustion, represented 52.73% of the total variance, with factor loadings ranging between 0.78 and 0.52. The items "when I work, I usually feel energetic" and "I can handle the pressure of my work well" were excluded for being considered inadequate for this factor. Factor 1 had a Cronbach's *alpha* value of 0.82. Factor 2, called Disengagement, represented 27.66% of the variance, with factor loadings ranging from 0.85 to 0.57. This second factor had a Cronbach's *alpha* coefficient of 0.83. The item "I consider my work to be a challenge" was excluded for being considered inadequate for this factor. It is important to highlight that the overall Cronbach's *alpha* value of our scale achieved 0.88.

Finally, to characterize the sample, sociodemographic questions gathered information on age, sex, marital status, and the number of dependents.

2.7 STATISTICAL METHODS

The Statistical Package for Social Science (SPSS) software, version 20.0, was used to analyze the quantitative data. The Kolmogorov-Smirnov and Shapiro-Wilk tests were used to verify the parametric distribution of the data. As the variables did not exhibit a normal distribution, non-parametric statistics were adopted. In addition to descriptive statistics (measurements of central tendency and dispersion), chi-square tests were performed, adopting a significance level of 5%; when the assumption of normality was not met, the Fisher and Kruskal Wallis tests were used.

3 RESULTS

3.1 SOCIODEMOGRAPHIC DATA

The study sample consisted of 78 participants. Of these, 87.2% were attendings, and, 12.8%, were residents (Table 1).

Table 1: Sex distribution of the OMFS surgeons and residents.

	Surgeons		Residents	
	Frequency	Percentage	Frequency	Percentage
Males	60	88.2%	7	70%
Females	8	11.8%	3	30%
Total	68	100%	10	100%

Source: Elaborated by the author (2021).

The age of the attendings ranged from 26 to 62 years (Mean (M) = 37.8; Standard Deviation (SD) = 7.5), and residents' age ranged from 23 to 34 years (M = 26.8; SD = 2.9) (Table 2).

Table 2: Age distribution of the OMFS surgeons and residents.

	Surgeons	Residents
Mean	37.8	26.8
Median	36.5	26.5
SD	7.5	2.9
Minimum	26	23
Maximum	62	34

SD = standard deviation.

Source: Elaborated by the author (2021).

The marital status of most attendings was married (79.4%), whereas most residents were single (80%) (Table 3).

Table 3: Marital status distribution of the OMFS surgeons and residents.

	Surgeons		Residents	
	Frequency	Percentage	Frequency	Percentage
Married	54	79.4%	2	20%
Single	11	16.2%	8	80%
Divorced	3	4.4%		
Total	68	100	10	100%

Source: Elaborated by the author (2021).

3.2 PROFESSIONAL DATA

OMFS attending surgeons

It was observed that 50% of the attending surgeons worked between 51h and 70h per week, with 8.8% reporting a workload of more than 80h per week. Most participants in this group see more than 10 patients daily. Approximately 41% of the interviewees in this group had not taken a vacation from work in over a year, and 19%, in over two years. Results showed that 79.4% of those surveyed declared they were able to balance their personal and professional lives. Over half of the attendings (51.5%) worked at a public hospital, with 89.1% working at hospitals in Fortaleza. For 70.6% of the attending surgeons, their income met their personal needs.

OMFS residents

Most residents were attending their third year (70%) of the residency program. When feeling exhausted, most did not approach their supervisor (60%). Approximately 50% of residents worked between 41h and 60h per week, whereas the other 50% reported working between 61h and 70h. Most residents see more than 15 patients per day. When asked about the last time they took a vacation from work, 70% reported it had been between 6 months and 2 years before. As for balancing personal and professional life, 60% stated their job did not interfere with their personal life. Half of the participants of this group answered that the income value of their residency scholarship was not enough to meet their needs.

3.3 DESCRIPTIVE MEASUREMENTS RELATED TO THE BS LEVEL

Most attendings surgeons (58.7%) and residents (40%) had a moderate level of burnout. The data regarding the BS levels were categorized according to the study by Torres (2020) (Torres, 2020) (Table 4).

Table 4: Burnout level of the OMFS surgeons and residents.

Burnout level	Surgeons	Residents
Low	35%	30%
Moderate	58,7%	40%
High	5,9%	30%

Source: Elaborated by the author (2021).

BS and sociodemographic variables

The associations between sociodemographic variables (sex, age, and marital status) and the levels of BS are shown in table 5.

Table 5: Burnout assessment by sex, marital status, and age of the OMFS surgeons and residents.

Variables	Surgeons				Residents			
	Low	Moderate	High	p-value	Low	Moderate	High	p-value
<i>Sex</i>								
Male	22	36	2	0.767**	3	4	1	0.200**
Female	2	6	0		1	0	2	
<i>Marital status</i>								
Single	2	9	0	0.644**	2	3	3	1.000**
Married	21	31	2		1	1	0	
Divorced	1	2	0		0	0	0	
<i>Age</i>								
Median	36	37	47	$H(2) = 3.059$ 0.21*	27	26	25	$H(2) = 2.960$ 0.22*

*Kruskal-Wallis' test; **Fisher's test.

Source: Elaborated by the author (2021).

BS and professional activity variables

To analyze the association between the level of burnout and the number of hours worked per week by attendings and residents, chi-square analysis was performed: ($X^2(4) = 5.778$, $p=0.21$) and ($X^2(6) = 4.910$, $p=0.55$), respectively.

To analyze the extent to which the levels of burnout were equivalent to the number of patients seen by surgeons and residents, the Kruskal-Wallis test was applied, revealing a statistically significant value for residents ($H(2) = 6.010$, $p = 0.05^*$); However, this test show no statistical difference among the attendings ($H(2) = 0.918$, $p = 0.63$).

Emotional Exhaustion (EE) and Professional Disengagement (PD)

Most participants answered “neither agree nor disagree” for the two factors on the scale: Emotional exhaustion (57.7%) and Professional disengagement (39.7%). Thus, no prevalence of EE or PD among the respondents was observed.

4 DISCUSSION

The present study evaluated the levels of BS in OMFS attending surgeons and residents in the State of Ceará during the COVID-19 pandemic. Although the OMFS specialty has significant importance in procedures involving clinical and surgical diagnoses and treatments, a career in surgery will involve challenging interventions, as they are often treated on an emergency basis. This specialty requires not only a high degree of knowledge, self-control, and resilience (Shanafelt et al., 2009) but also visual acuity and the ability to perform delicate technical manipulations (LaPorta, 2010).

In this study, we observed that most attendings and residents exhibited moderate levels of burnout. Although occupational stress is a complex of emotional reactions inherent to the nature of a given job,

which may lead to burnout, its impact varies according to the characteristics, trends, and individual triggers of each professional. Therefore, the personality traits and the way of coping with the stress of each individual have a greater effect than the nature of the work itself (LaPorta, 2010). Al Tassi et al. (2018) demonstrated that more than half of OMFS residents in the United States reported moderate to severe anxiety. Furthermore, the levels of anxiety and personal fulfillment were found to be inversely proportional: the higher the level of anxiety, the lower the level of personal achievement. Porto et al. (2014) reported a median rate of BS, 17.2%, which was associated with a low sense of personal accomplishment in their profession among Brazilian OMFS surgeons.

The study by Gorter et al. (2012), carried out a study in the Netherlands that showed a relatively low risk for BS among OMFS surgeons compared to general dental practitioners. Demands for practice and organization, in addition to the lack of variation in work, were the main contributors to this result. The accomplishment in executing the work and its appreciation by the patients, the variety of work in clinical cases, and the perception of making patients healthy and happy were the factors that contributed to the positive results of engagement with work.

When considering age and experience in OMFS, our study found that attending surgeons were aged between 26 and 62 years ($M = 37.8$; $SD = 7.5$), with 58.7% of them exhibiting a moderate level of burnout. AlKindi et al. (2020) concluded that older surgeons were less happy to deal with new or interesting cases. Moreover, Marreli et al. (2014) explained that less experienced professionals were less able to manage their work than surgeons with more experience.

Regarding the relationship between burnout and excessive working hours, the studies by Porto et al. (2014) and AlKindi et al. (2020) evidenced that surgeons work more than 40 hours a week. Contag et al. (2010) indicated that the number of hours worked was not directly related to higher levels of burnout, which were directly affected by other factors such as interference of the job with personal life, as well as the poor perception of control over their professional life.

Furthermore, the impact of the COVID-19 pandemic on the personal and professional lives of those who provide health care is a factor that deserves attention. Anxiety is a feeling that is spreading (Amin, Austin, Roser, & Abramowicz, 2021) among healthcare professionals due to the presence of continued tension concerning the provision of health services, their safety, the patient's life, and the lives of family members and friends (Panesar et al., 2020).

The impact of the COVID-19 pandemic on BS has been investigated in residency programs in several medical fields such as anesthesiology, orthopedic surgery, general surgery, and family practice; however, only a few studies were published on OMFS attendings surgeons and residents. According to previous data, BS and factors that can trigger depression during residency can originate from an interrelationship of several factors such as the number of hours worked, experiences of shame and humiliation, psychological effects, and impact on interpersonal relationships throughout the residency (Shapiro, Rao, Dean, & Salama, 2017).

Patel et al. (2020) stated that the COVID-19 pandemic is an opportunity for the OMFS specialty to harness the field's multidisciplinary training and step into crucial frontline roles (Patel, Ji, & Odera, 2020), helping identify and recognize suspected cases, symptoms, risk groups, disease intensity levels, systemic changes and interpret laboratory and tomographic tests (Peng et al., 2020). In this scenario, Ferrel and Ryan (2020) have highlighted that understanding the current situation is essential to create measures to appropriately deal with the ongoing changes (Santos, Silva, Caracas, & Mel, 2021; Ferrel & Ryan, 2020) that have considerably impacted and disrupted the routine of residency and other training programs around the world.

The results obtained in this study showed that 50% of residents work between 61 and 70 hours per week. AlKindi et al. (2020) explained in their study that there is a direct relationship between increased working hours and accentuated stress among residents. Furthermore, it was found that this relationship harms social relationships. It was observed that, although residents are expected to work five days per week, 25.5% reported being at work seven days per week because of on-call shifts. More working hours per day and working days per week were significantly correlated with increased levels of stress (AlKindi et al., 2020).

5 CONCLUSION

Most attendings surgeons and residents from OMFS residency programs in Ceará presented moderate levels of burnout during the COVID-19 pandemic. The uncertainty regarding the duration of the pandemic and the routine endeavors of the hospital environment, such as stress, anxiety, and depression, which may negatively impact mental and emotional health, resulting in emotional exhaustion and professional disengagement, may have contributed to this result.

Research on OMFS attendings and residents seeking to characterize professional and sociodemographic factors is scarce. Therefore, this work may serve as a guide for future studies aiming at gathering information to develop targeted measures in favor of the well-being of OMFS attending surgeons and residents in their work environment during this pandemic period.

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