Perception of Life Quality of Individuals with Periodontal Disease during Covid-19 Pandemic in Brazil

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Abstract

In January 2020, the World Health Organization identified COVID-19, caused by the SARS-CoV-2 virus, as a global health emergency. Restrictive measures and uncertainties resulted in a time of high stress, anguish, anxiety, depression and other psychosomatic symptoms. Studies have indicated that oral health was affected by the increased frequency of caries, bruxism and periodontal disease related to the COVID-19 pandemic. The aim of this research was to evaluate the impairment of quality of life of individuals aged between 20 and 70 years, diagnosed with periodontal disease during the COVID-19 pandemic. Material and methods: After the approval of Ethics and Research, the data collection was done by online questionnaire, built on the Google Forms platform® and disclosed to periodontist dentists. The form was original multithematic containing 25 semi-structured questions, which were divided into sociodemographic questions and objective and subjective questions, according to the norms of resolution 510/16 (BRAZIL, 2016). The questionnaire was accessible for 3 months between June and September 2021. As a result, 125 responses were obtained, 14 of which were excluded: 13 because they corresponded to those over 70 years of age and 01 because the patient did not state age. The total number of valid answers was 111. It can be concluded that the COVID-19 Pandemic contributed to the impairment of quality of life and the appearance of oral alterations, bruxism and intensification of previously existing problems such as periodontal disease, mainly due to inadequate or insufficient self-care practices.

Keywords: Pandemic COVID-19, periodontal disease, quality of life.

1 Introduction

Periodontal disease (PD) comprises a group of diseases involving host inflammatory aspects and dysbiotic events that affect periodontal tissues and may have systemic implications. [1] PD is an inflammatory disease that may be limited to the protective tissue of the teeth (gums) and also lead to the destruction of periodontal ligament support structures, and alveolar bone (periodontitis) The relationship between periodontal disease, systemic conditions and emotional conditions has been widely studied. [2]

The main etiological factor in the development of gingivitis is the supragingival biofilm along the gingival margin. Gingivitis is the inflammatory response of gingival tissues to metabolic products and pathogenic toxins from bacteria found in oral biofilm. Inflammatory alteration of the supragingival plaque is a predisposing factor for the progression of the disease. Although gingivitis does not always progress to periodontitis, periodontitis is preceded by gingivitis. [3]

Periodontitis is a multifactorial and polymicrobial disease that involves host and environmental factors. Tissue destruction is mainly associated with the exacerbated host response, resulting in the release of inflammatory mediators – inflammatory cytokines, which play an important role in bacterial stimulation and tissue destruction. In addition, cytokines can be the basis of the associations between periodontitis and systemic conditions. [4]

In addition to microbiological changes, changes in the immune system can stimulate an inflammatory response in tissues and, consequently, an increase in inflammatory cytokines. These cytokines and other chemical mediators released during the inflammatory response are able to stimulate collagen destruction, triggering the rapid progression of the disease. The relationship between periodontal disease and systemic conditions has been widely studied. Increased production of pro-inflammatory cytokines is the main cause of covid-19-related adverse events and periodontal disease may further increase the release of cytokines via

altered microflora. Inadequate oral hygiene can aggravate SARS-Cov-2 infection, so the importance of maintaining good oral hygiene and periodontal health to preserve overall health. [4]

The oral cavity, already colonized by several microorganisms, became the habitat of SARS-Cov-2. Plaque control is essential to prevent the interaction of bacteria between the oral cavity and lungs, reducing the risk of lung diseases [5]. The literature shows that oral hygiene habits, the presence of biofilm and gingival bleeding vary according to sociodemographic factors, such as age, gender, economic and cultural level. [6,7] In addition, the change in these habits is often difficult to be achieved due to social, cultural and governmental influences [8].

The concept of quality of life is directly related to that of self-perception, with regard to the interpretation of the individual's experiences and general health status in the context of daily life, both of which are based on knowledge about health and disease. Most of the time, the reason people do not seek dental care is the non-perception of their needs. [9,10,11]

When assessing their oral condition, individuals use criteria different from those used by professionals. While the dentist evaluates the condition based on the presence or absence of disease, the patient gives more importance to the symptoms and functional and social problems that are caused by the disease. Self-assessment provides the individual with an understanding of his/her own oral condition, being an essential factor, both to motivate him/her to seek improvements in his/her oral health, and to seek preventive and educational strategies. [12,13]

Therefore, in view of the restrictive measures in the pandemic that generated impairment in the quality of life of individuals, the aim of the study is to evaluate and quantify the possible alterations in oral health in the pandemic and stimulate measures to promote oral health, and perception of individuals, to contain the comorbidities presented.

2 Materials And Methods

The research proposal is to make a descriptive, cross-sectional, qualitative and quantitative analysis of patients diagnosed with periodontal disease. The study was approved by the Ethics and Research Committee of the Veiga de Almeida University, opinion number 4,746,573, in accordance with resolution 466/12 of the National Health Committee. Regarding the inclusion criterion, individuals between 20 and 70 years of age were selected and only questionnaires obtained from respondents diagnosed with periodontal disease were considered valid, which was previously evaluated by calibrated periodontist dentists, who disclosed the online questionnaire to their patients through the Google Forms platform. For the gingivitis criterion, the presence of more than 06 sites with bleeding at probing was defined, depth up to 3mm, without loss of insertion [14]. For periodontitis, the depth criterion to probing (PS) ≥ 6 mm, presence of Clinical Insertion Level (CIN) ≥ 4 mm was defined in at least two proximal sites of two teeth not adjacent to the presence of periodontal pocket. [15] Patients without periodontal disease under 20 and over 70 years of age did not participate in the present study.

2.1 Google Forms Questionnaire

The research was elaborated through an original multithematic questionnaire, containing 25 semi-structured questions, which were divided into sociodemographic questions and objective and subjective questions related to the theme, according to the norms of resolution 510/16 (BRAZIL, 2016). After the elaboration was built on the Google Forms platform® and disclosed to periodontist dentists who are part of the Brazilian Society of Periodontists (SOBRAPE) to refer to their patients diagnosed with periodontal disease. This questionnaire was available for answers for 3 months between June and September 2021.

The results could be visualized during the partial resolution of the collections, which allowed that at any time it could be observed how the research progressed, that is, the analysis was possible to be performed in real time. It was also possible to extract qualitative data from the responses provided through the platform [16].

2.2 Data collection

Data collection through the Google Forms Platform allowed us to experience significant experiences in the face of the distance between participants and thus obtain a significant number of participants from different municipalities in the following states: Mato Grosso do Sul, Minas Gerais, Rio de Janeiro, Rio Grande do Sul and São Paulo.

The data were analyzed using the descriptive statistics provided by the Google Forms form platform itself. At the time the questionnaires were sent by respondents, the data was saved in an Excel table and automatically performed by the platform at the time the survey was created. In this table, all the data listed for the completion of each questionnaire were available, the date and time at which it was answered and the answer of each question separately, each question in a different column, which makes it possible to generate graphs and define the percentage that each option was chosen in each question. From the main table, it was also possible to generate other tables with isolated data to make different analyses [17]. Thus, we perceived the need to share the knowledge constructed and the experiences experienced throughout this process.

2.3. Data analysis
During the statistical analysis, the Chi-square Test was used to evaluate the association between two variables. In the analysis of the groups, women - men were used. A confidence level of 95% was set, with a p-value of 0.05.

3 Results

Figure 1: Flowchart: Description of the number of participants
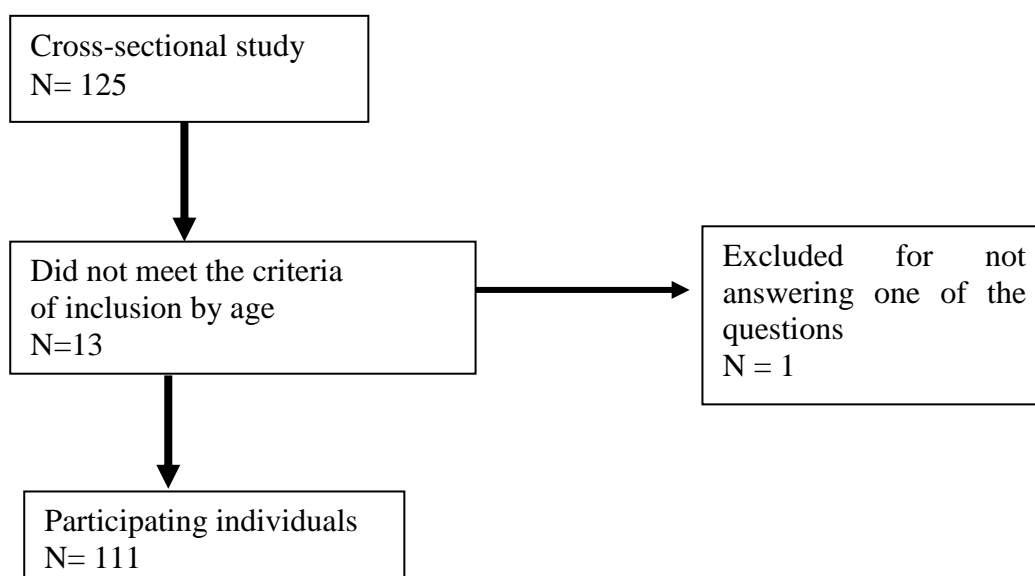
The study population consisted of 111 participants, 58 (52.3%) females, 45 (40.5%) males and 8 (7.2%) preferred not to declare. This population had the participation of 5 states: Mato Grosso do Sul: 1 (0.9%), Minas Gerais: 5 (4.5%), Rio de Janeiro: 85 (76.6%), Rio Grande do Sul: 2 (1.8%) and São Paulo: 18 (16.2%). The demographic characterization of the study showed that more than 60% of the participants were between 29 and 64 years old. Of the total number of people surveyed, 70 (63.1%) were working at the time and 41 (36.9%) were not working. (Table 1)

During the research period (from June 1 to September 4, 2021), 125 responses were obtained, 14 of which were excluded: 13 because they correspond to those over 70 years of age and 01 because the patient did not report age. Total valid answers: 111. (Figure 1)

Table 1 - Sociodemographic of the research subjects (Percentage %)

SOCIODEMOGRAPHIC		Female	Male	Not declared	%
Location	RJ	43	34	08	76.6
	SP	09	09	-	16.2
	MG	04	01	-	4.5
	MS	-	01	-	0.9
	RS	02	-	-	1.8
Age	20-39 years	15	21	07	38.7
	40-59 years	21	10	-	27.9
	60-70 years	22	14	01	33.4

Gender		58 (52,3%)	45 (40,5%)	08 (7,2%)	-
Race	BROWN	16	20	04	36
	WHITE	28	18	02	43.2
	BLACK	12	07	02	18.9
	YELLOW	02	-	-	1.9
Marital status	SINGLE	10	16	06	28.8
	MARRIED	22	13	-	31.5
	STABLE UNION	11	10	02	20.7
	DIVORCED	13	06	-	17.1
	WIDOW(ER)	02	-	-	1.9
Education	INCOMPL. ELEM.		01		0.9
	COMPL. ELEM.		-		1.0
	INCOMPL. HIGH. SCH.	01	01		1.8
	COMPL. HIGH. SCH.	16	06	01	20.7
	INCOMPL. HGR. EDU.	10	14		26.1
	COMPL. HGR. EDU.	07	09	02	16.2
	INC. POST GRAD.	02	04	05	5.4
	COMP. POST GRAD.	22	10		28.8
Working?	Yes	24	30	06	63.1
	No	34	15	02	36.9
Had Covid-19	Yes	11	07	04	30
	No	37	38	04	70
Do you take medication for anxiety or depression?	Yes	2	0	0	1.8
	No	56	45	04	98.2

Table 2: Self-perception of the studied sample (Chi-square test p-value≤0.05)

Self-perception		Female	Male	Not declared	p-Value
Regarding your mood **You can tick more than one alternative**	Anguish	24	16	04	0.549
		24	16	04	0.549
	Anxiety	24	06	04	0.001*
		24	06	01	0.001*
	Sadness	06	08	04	0.274
		06	06	-	0.639
	Happiness	04	03	-	0.963
	Pessimistic				
	Optimistic				
	Normal				
Sleep	Hectic	21	19	5	0.534
		25	11	3	0.048*
	Insomnia	12	15	-	0.147
	Normal				
How do you feel in isolation? **You can tick more than one alternative**	Stress	15	11	03	0.869
		08	08		0.639
	Worried	01	02		0.274
		02	03		0.450
	Normal	01	03		0.204
		01	04	01	0.103
	Depressed	04	08	03	0.087
		05	03		0.713
	is depressed	02	04		0.103
	Str, Wor,Dep	06	02		0.713

	str, worried				
	Str, Wor, Dep				
	Fear				
	Fear, Str, Dep, Wior				
Feeding	No appetite	11	**06**	01	0.445
	Increased appetite	19	**15**	03	0.950
		08	**12**	-	0.101
	No change	20	**12**	04	0.395
	Eating + sweets				
Smoking?	Yes	02	02	04	0.450
	No	56	43	04	0.795
Diabetes?	Yes	1	1	-	0.450
	No	57	44	08	0.795
How long has it been since you went to the dentist?	I go regularly	16	10	-	0.534
	+ 6 months	12	11	04	0.850
	+ 1 year	29	22	03	0.910
	+ 2 years	01	02	01	0.274
Number of brushings	1x	-	02		-
	2x	28	22	05	0.950
	3x or more	30	21	03	0.910
What do you use to clean your mouth? (check as many options as you like)	Toothbrush	15	11	08	0.869
	Toothpaste	15	11	08	0.869
	Floss	15	11	08	0.869
	Rinses	07	07	07	0.686
	Tongue cleaner	06	05	07	0.900
When you're tense, do you feel like you clench your teeth?	Yes	50	38	08	0.801
	No	08	07	-	0.900
Do you feel any teeth with mobility?	Yes	16	21	02	0.045*
	No	42	24	06	0.045*
Do you have headaches or pain in the muscles of your face when you wake up?	Yes	24	28	08	0.035*
	No	34	17	-	0.035*
Do your gums bleed when you brush your teeth?	Yes	35	25	07	0.624
	No	23	20	01	0.624
Do you have a bitter or sour taste in your mouth?	Yes	32	21	03	0.391
	No	26	24	05	0.391
Do you feel like you have tartars?	Yes	49	31	05	0.059
	No	09	14	03	0.059
Cracked or broken teeth?	Yes	46	26	08	0.018*
	No	12	19	-	0.018*

4 Discussion

Self-perception of quality of life is difficult to measure, due to the subjective characteristic it has. There is no parameter for comparations, but rather the individual's particular observation of their questions.

The literature shows that psychological reactions to previous epidemics and pathies depend on individual issues such as intolerance to uncertainty, perceived vulnerability to diseases and anxiety. [18] The items "mood perception" and "feelings" regarding isolation restrictions in the pandemic", may be associated with several studies that intrinsically report the lack of confidence in the health system to deal with new cases, concerns about becoming infected, fear of death, increased hygienic behaviors and social withdrawal, lack

of information, create an environment of anxiety and depression that interferes with basic daily activities, including sleep quality. [19,20,21]

In the evaluation of the questionnaire used in the present study, regarding sleep quality, in the items "restless" and "insomnia" (Table 2), the findings are in agreement with the studies by Mc Ewen and Karatsoreos 2015, which conclude that sleep should be recovered, as it preserves the physical, mental and psychological health of human beings. Considering the role of sleep in the individual's life and the harmful effects on their lack, an adequate sleep level directly influences quality of life. [22]

Another aspect such as stress, according to Rosseti et al,[23] when excessive, causes psychological and physical consequences, such as mental fatigue, tension, diseases and generalized pain. In the item that addresses stress, it can be observed that women reported more stress and tension compared to men. These psychophysiological responses occur because there is a link between the neurological, immunological and endocrine systems to perform the regulatory functions of the organism and control against external and internal stimuli. [23]

Stress also plays an important role in modulating the immune response due to reduced defense capacity and, as a consequence, making the organism more susceptible to the development of psychosomatic and inflammatory diseases, which may favor the onset or progression of periodontal disease. [24] This situation can be observed in the following items: bleeding, tooth mobility and the presence of biofilm (tartar), where the results were matched between women and men. We can also observe, regarding feeding, the increase in sweet consumption and appetite in both groups, situations that can provide greater accumulation of biofilm, with an impact on the progression of periodontal disease and the appearance of dental caries.

Studies have reported that higher levels of cortisol (stress hormone) were associated with a worsening of periodontitis and a reduction in immune system capacity. The combination of changes in inflammatory responses and depression of the immune system, caused by high levels of cortisol in the body, lead to a recognition of psychological stress as a potential factor for the pathogenesis of chronic diseases such as periodontitis. [25,26]

Studies indicate that stress is a relevant psychosocial factor and can be part of the various causes that contribute to the etiology of periodontitis and the association of these two comorbidity indicates that the maintenance of periodontal health is essential in patients with psychological stress. [27,28]

According to P. Kolte, psychological factors, such as anxiety and depression, are also associated with changes in the immune response, which can increase susceptibility to periodontitis. [29]

In the present study, it was also observed that there may be a relationship between muscle pain, stress and bruxism. According to Tuz et al, the symptoms of bruxism include: pain and tinnitus in the ear, pain in the neck, jaw and muscles of the face due to the effort exerted by the mastication muscles, snaps when opening and closing the mouth and sleep changes. [30] According to Shetty et al, peripheral, central and psychosocial factors are relevant for the pathophysiology of bruxism, which may predispose pain in the muscles of chewing and neck, headache, decreased pain threshold in chewing and cervical muscles, limitation of jaw range of motion, sleep disorders, stress, anxiety, depression and general deterioration of oral health. [31]

Based on a study conducted in 2020, it was observed that the worsening of the psychoemotional state caused by the COVID-19 pandemic can result in bruxism and intensification of TMD symptoms and, consequently, lead to increased orofacial pain. [32] In the questionnaire applied, this statement is in accordance with the result of the relationship of tension with the clenching of the teeth (bruxism).

The COVID-19 pandemic could lead to major impacts on applied oral sciences in the coming years. It is to be expected that psychological factors associated with the pandemic may lead to a higher risk of developing, worsening and perpetuator bruxism and TMD. [33]

According to Santos et al, self-perception is important because it guarantees the ability to identify their problems and thus seek help to intervene and prevent their evolution. [34]

The literature shows that oral hygiene habits, the presence of biofilm and gingival bleeding are not equally distributed in the population and vary according to sociodemographic factors, such as age, gender, economic and cultural level. [35, 36]. According to Maltz, the frequency of brushing is important because it works as a topical application of daily fluoride, through the use of fluoridated toothpastes [37] and as for brushing teeth three times a day, it is important for the prevention of oral diseases. [38]

The observations of the study are in agreement with the WHO, quality of life consists in the "perception of the individual of his insertion in life, in the context of culture and value systems in which he/she lives and in relation to his/her goals, expectations, standards and concerns". [39] It is a definition that contemplates the

influence of physical and psychological health, level of independence, social relations, personal beliefs and their relationships with characteristics inherent to the respective environment in the subjective assessment of individual quality of life.

The COVID-19 pandemic significantly influenced several aspects of the quality of life of individuals, as well as their physical and psychological health. Community-based interventions are needed to mitigate the negative effects of the pandemic and improve the health and quality of life of the general population. [40]

Therefore, when evaluating all the factors asked, we can conclude that emotional factors during restrictive measures may be associated with a series of oral alterations and relaxation in oral hygiene self-care.

5 Conclusion

It can be concluded that there was a impairment of quality of life with the possible influence of factors such as stress, anxiety and fear of the individuals in this study during the COVID-19 pandemic. Especially when evaluated factors such as: bruxism, gingival bleeding, tooth brushing, increased consumption of sweets, in addition to problems of mood change and increased time of return to the dentist. This demonstrates that health professionals should be attentive to patients regarding their integrality, because there was a great compromise of health in general. Other longitudinal controlled epidemiological studies should be conducted to further emphasize this association and enable more satisfactory diagnoses and treatments for patients.

6 Study Limitation

1. Cross-sectional observational study is a limitation of the study, because it does not allow to determine the cause-effect relationship.

2. Influence of confounding factors may contribute to different perceptions of participants, such as socially accepted responses.

3. The item that addresses anxiety fear and depression could have been evaluated through scales such as: Quiz and Personality Tests on Anxiety, Scale Had, The DASS-21 questionnaire (Depression, Anxiety and Stress Scale) among others.

7 References

1. Pitones-Rubio V, Chávez-Cortez EG, Hurtado-Camarena A, González-Rascón A, Serafín-Higuera N. Is periodontal disease a risk factor for severe COVID-19 illness? Med Hypotheses. 2020 Nov;144:109969. doi: 10.1016/j.mehy.2020.109969. Epub 2020 Jun 19. PMID: 32592918; PMCID: PMC7303044. Disponível em: https://pubmed.ncbi.nlm.nih.gov/32592918/

2. Sukumar K, Tadepalli A. Nexus between COVID-19 and periodontal disease. J Int Med Res. 2021 Mar;49(3):3000605211002695. doi: 10.1177/03000605211002695. PMID: 33745336; PMCID: PMC7989136. Disponível em: https://pubmed.ncbi.nlm.nih.gov/33745336/

3. Shirozaki MU, da Silva RAB, Romano FL, da Silva LAB, De Rossi A, Lucisano MP, Messora MR, Feres M, Novaes Júnior AB. Clinical, microbiological, and immunological evaluation of patients in corrective orthodontic treatment. Prog Orthod. 2020 Feb 17;21(1):6. doi: 10.1186/s40510-020-00307-7. PMID: 32064567; PMCID: PMC7024686.Disponível em: https://pubmed.ncbi.nlm.nih.gov/32064567/

4. Socransky S S, Haffajee A D, Cugini M A, Smith C, Kent R L., Jr. Microbial complexes in subgingival plaque. J Clin Periodontol. 1998;25(02):134–144.

5. Botros N, Iyer P, Ojcius DM. Is there an association between oral health and severity of COVID-19 complications? Biomed J. 2020 Aug;43(4):325-327. doi: 10.1016/j.bj.2020.05.016. Epub 2020 May 29. PMID: 32713780; PMCID: PMC7258848. Disponível em: https://pubmed.ncbi.nlm.nih.gov/32713780/

6. Al-Otaibi M, Angmar-Månsson B. Oral hygiene habits and oral health awareness among urban Saudi Arabians. Oral Health Prev Dent. 2004;2(4):389-96. PMID: 16296258. Disponível em: https://pubmed.ncbi.nlm. nih.gov/16296258/

7. Almas K, Al-Hawish A, Al-Khamis W. Oral hygiene practices, smoking habit, and self-perceived oral malodor among dental students. J Contemp Dent Pract. 2003 Nov 15;4(4):77-90. PMID: 14625597. Disponível em: https://pubmed.ncbi.nlm.nih.gov/14625597/

8. Arcieri RM, Rovida TAS, Lima DP, Garbin AJI, Garbin CAS. Análise do conhecimento de professores de educação infantil sobre saúde bucal. Educ Rev 2013; 47(1):301-14. Disponível em: https://www.scielo.br/j/er/a/ zmVHm9Yx4cLK7zCxgW4pcsR/?lang=pt

9. Bombarda-Nunes FdF, Miotto MHMdB, Barcellos LA. Autopercepção de saúde bucal do agente comunitário de saúde de Vitória, ES, Brasil. Pesq Bras Odontoped Clin Integr 2008; 8(1):7-14 DOI: 10.1590/1413-81232014199. 12912013 .Disponível em: https://www.scielo.br/j/csc/a/ 8VGybkZ9SG7wLQ97zMvHPwf/?lang=pt&format=pdf

10. Matos IDL, Lima-Costa MF. Auto-avaliação da saúde bucal entre adultos e idosos residentes na Região Sudeste: resultados do Projeto SB-Brasil, 2003. Cad Saúde Pública 2006; 22(8):1699-707. Disponível em: https://www.scielo.br/j/csp/a/HhsGHtTfKnCBy9SJySXPDXH/?format=pdf&lang=pt

11. Silva SRCdS, Fernandes RAC. Autopercepção das condições de saúde bucal por idosos. Rev Saúde Púb 2001; 35(4):1-10. https://doi.org/10.1590/S0034-89102001000400003. Disponível em: https://www.scielo.br/j/rsp/a/ Ls5WhbkRrRBSFd5m6N74JDj/abstract/?lang=pt

12. Bortoli D, Locatelli FA, Fadel CB, Baldani MH. Associação entre percepção de saúde bucal e indicadores clínicos e subjetivos: estudo em adultos de um grupo de educação continuada da terceira idade. UEPG Ci Biol Saúde 2003; 9(3/4):55-65. Disponível em: file:///C:/Users/Leila/Downloads/370-Texto%20do%20artigo-1171-1-10-20090610.pdf

13. Rosa RR, Henriques JCG, Anhalt ACF, Castilho JCdM, Rodrigues JR, Nicodemo D. Autopercepção da saúde bucal e anamnese em idosos. Rev Cienc Med 2013; 22(1):5-11. Disponível em: http://revodonto.bvsalud.org/scielo.php?script=sci_arttext&pid=S1413-40122015000300003

14. CHAPPLE I.L.C. et al. Periodontal health and gingival diseases and conditions on an intact and a reduced periodontium: consensus report of workgroup 1 of the 2017 World Workshop on the Classification of Periodontal and PeriImplant Diseases and Conditions. J. periodontol., Chicago, v.89, suppl.1, p.S74-S84, 2018b.

15. Tonetti MS, Greenwell H, Kornman KS. Staging and grading of periodontitis: Framework and proposal of a new classification and case definition. J Periodontol. 2018; 89 (February): S159–72

16. Monteiro R.L.S & Santos D.S. (2019) A utilização da ferramenta google forms como instrumento de avaliação do ensino na escola superior de guerra. Revista Carioca de Ciência, Tecnologia e Educação (online). 4(.2):28-38. Acesso em 09 de julho de 2020. Disponível em: https://recite.unicarioca.edu.br/rccte/ index.php/rccte/article/view/72/106.

17. Andres F.C et al (2020) Conhecimento de enfermeiros acerca das práticas integrativas e complementares em saúde. Research, Society and Development, 9(7):1-15 | Acesso em 09 de julho de 2021. DOI: http://dx.doi. org/10.33448/rsd-v9i7.517.

18. Taylor S. The psychology of pandemics: preparing for the next global outbreak of infectious disease. Cambridge: Cambridge Scholars Publishing; 2019. Disponível em: https://cambridgescholars.com/product/978-1-5275-3959-4

19. Qu X, Zhou XD. [Psychological intervention for patients with oral disease during the pandemic period of COVID-19]. Zhonghua Kou Qiang Yi Xue Za Zhi. 2020 Apr 9;55(4):235-240. Chinese. doi: 10.3760/cma.j.cn112144-20200213-00053. PMID: 32086886. Disponível em: https://pubmed.ncbi. nlm.nih.gov/32086886/

20. Asmundson GJ, Taylor S. Coronaphobia: fear and the 2019- nCoV outbreak. J Anxiety Disord. 2020;70:102196. doi: 10.1016/j. janxdis.2020.102196 Disponível em: https://pubmed.ncbi.nlm.nih.gov/32078967/

21. Bao Y, Sun Y, Meng S, Shi J, Lu L. 2019-nCoV epidemic: address mental health care to empower society. Lancet. 202022;395(10224):e37-8. doi: 10.1016/S0140-6736(20)30309-3. Disponível em: https://pubmed.ncbi.nlm. nih.gov/32043982/

22. McEwen BS, Karatsoreos IN. Sleep Deprivation and Circadian Disruption: Stress, Allostasis, and Allostatic Load. Sleep Med Clin. 2015 Mar;10(1):1-10. doi: 10.1016/ j.jsmc. 2014.11.007. PMID: 26055668.Disponível em: https://pubmed.ncbi.nlm.nih. gov/26055668/

23. Rossetti MO, Ehlers DM, Guntert IB, Leme IF, Almeida de Sá R, Sant'Ana IT, et al. O inventário de sintomas de stress para adultos de lipp (ISSL) em servidores da polícia federal de São Paulo. Rev Bras Terap Cognit. 2008;4:108-20.Disponível em: http://pepsic.bvsalud.org/scielo.php?script=sciarttext&pid=S180856872008000200008

24. Alves S, Gomes C. INFLUÊNCIA DO ESTRESSE NA PROGRESSÃO E SEVERIDADE DA DOENÇA PERIODONTAL:. Revista Cathedral [Internet]. 11fev.2020 [citado 15fev.2022];2(1). Available from: http://cathedral.ojs.galoa. com.br/index.php/cathedral/article/view/118

25. Castro MML, Ferreira RO, Fagundes NCF, Almeida APCPSC, Maia LC, Lima RR. Association between Psychological Stress and Periodontitis: A Systematic Review. Eur J Dent. 2020 Feb;14(1):171-179. doi: 10.1055/s-0039-1693507. Epub 2020 Feb 18. PMID: 32069501; PMCID: PMC7069755.Disponível em: https://pubmed.ncbi.nlm.nih.gov/32069501/

26. Parwani R, Parwani SR. Does stress predispose to periodontal disease? Dent Update. 2014 Apr;41(3):260-4, 267-8, 271-2. doi: 10.12968/denu.2014.41.3.260. PMID: 24839715. Disponível em: https://pubmed.ncbi.nlm.nih.gov/24839715/

27. Boyapati L, Wang HL. The role of stress in periodontal disease and wound healing. Periodontol 2000. 2007;44:195-210. doi: 10.1111/j.1600-0757.2007.00211.x. PMID: 17474934.Disponível em: https://pubmed.ncbi.nlm. nih.gov/17474934/

28. Warren KR, Postolache TT, Groer ME, Pinjari O, Kelly DL, Reynolds MA. Role of chronic stress and depression in periodontal diseases. Periodontol 2000. 2014 Feb;64(1):127-38. doi: 10.1111/prd.12036. PMID: 24320960; PMCID: PMC7167640. Disponível em: https://pubmed.ncbi.nlm.nih.gov/24320960

29. P Kolte A, A Kolte R, N Lathiya V. Association between anxiety, obesity and periodontal disease in smokers and non-smokers: A cross-sectional study. J Dent Res Dent Clin Dent Prospects. 2016 Fall;10(4):234-240. doi: 10.15171/joddd.2016.037. Epub 2016 Dec 21. PMID: 28096949; PMCID: PMC5237670. Disponível em: https://pubmed.ncbi.nlm.nih.gov/28096949/

30. Tuz HH, Onder EM, Kisnisci RS. Prevalence of otologic complaints in patients with temporomandibular disorder. Am J Orthod Dentofacial Orthop. 2003 Jun;123(6):620-3. doi: 10.1016/s0889-5406(03)00153-7. PMID: 12806339. Disponível em: https://pubmed.ncbi.nlm.nih.gov/12806339/

31. Shetty S, Pitti V, Satish Babu CL, Surendra Kumar GP, Deepthi BC. Bruxism: a literature review. J Indian Prosthodont Soc. 2010 Sep;10(3):141-8. doi: 10.1007/s13191-011-0041-5. Epub 2011 Jan 22. PMID: 21886404; PMCID: PMC3081266. Disponível em: https://pubmed.ncbi.nlm.nih.gov/21886404/

32. Emodi-Perlman A, Eli I, Smardz J, Uziel N, Wieckiewicz G, Gilon E, Grychowska N, Wieckiewicz M. Temporomandibular Disorders and Bruxism Outbreak as a Possible Factor of Orofacial Pain Worsening during the COVID-19 Pandemic-Concomitant Research in Two Countries. J Clin Med. 2020 Oct 12;9(10):3250. doi: 10.3390/jcm9103250. PMID: 33053640; PMCID: PMC7601612. Disponível em: https://pubmed.ncbi.nlm.nih.gov/33053640/

33. Almeida-Leite CM, Stuginski-Barbosa J, Conti PCR. How psychosocial and economic impacts of COVID-19 pandemic can interfere on bruxism and temporomandibular disorders? J Appl Oral Sci. 2020;28:e20200263. doi: 10.1590/1678-7757-2020-0263. Epub 2020 May 11. PMID: 32401942; PMCID: PMC7213779.Disponível em: https://pubmed.ncbi.nlm.nih.gov/ 32401942/

34. Santos, K., Gomes, R., Ribeiro, A., Dantas, D., Sampaio, C., & Augusto, S. (2016). Conhecimento e percepção dos pacientes sobre saúde bucal. Revista Da Faculdade De Odontologia - UPF, 20(3). https://doi.org/ 10.5335/ rfo.v20i3.4443

35. Al-Otaibi M, Angmar-Månsson B. Oral hygiene habits and oral health awareness among urban Saudi Arabians. Oral Health Prev Dent. 2004;2(4):389-96. PMID: 16296258. Disponível em: https://pubmed.ncbi. nlm.nih.gov/16296258/

36. Almas K, Al-Hawish A, Al-Khamis W. Oral hygiene practices, smoking habit, and self-perceived oral malodor among dental students. J Contemp Dent Pract. 2003 Nov 15;4(4):77-90. PMID: 14625597. Disponível em: https://pubmed.ncbi.nlm.nih.gov/14625597/

37. Maltz M, Carvalho J. Tratamento da doença cárie. In: Kri- ger L (Org.). Promoção de saúde bucal. São Paulo: Artes Médicas; 1997. p. 95-111. Disponível em: http://revodonto.bvsalud.org/scielo.php?script=sci_arttext&pid= S1413-40122015000300003

38. Naressi WG, Moreira EJG. Odontologia preventiva: agentes mecânicos de higiene bucal. Rev Gaúcha Odontol 1982; 30(2):154-6. Disponível em: http://revodonto.bvsalud.org/scielo.php?script=sci_arttext&pid=S1413-40122015000300003

39. Worl Health Organization. IHR procedures concerning public health emergencies of international concern (PHEIC). http://www.who.int/ihr/ procedures/pheic/en/ (accessed Jan 29, 2022). [Links]

40. Algahtani FD, Hassan SU, Alsaif B, Zrieq R. Assessment of the Quality of Life during COVID-19 Pandemic: A Cross-Sectional Survey from the Kingdom of Saudi Arabia. Int J Environ Res Public Health. 2021 Jan 20;18(3):847. doi: 10.3390/ijerph18030847. PMID: 33498152; PMCID: PMC7863741. Disponível em: https://pubmed.ncbi.nlm.nih.gov/33498152/