

Impact of the pandemic caused by SARS-CoV-2 on the mental health of dental students: an integrative review

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Impact of the pandemic caused by SARS-CoV-2 on the mental health of dental students: an integrative review

Abstract

The mental health of dental students was impacted by the pandemic caused by SARS-CoV-2 (COVID-19). The aim of the present study was to perform an integrative review addressing the impact of the pandemic on the mental health of dental students. The PubMed (Medline) and SciELO databases were searched for relevant articles published in Portuguese, English and Spanish. The search strategy was composed of combinations of the following keywords: COVID-19, pandemic, dental students, dental education and mental health. Data collection was conducted in August 2021. The inclusion criteria were articles with any study design that described the impact of the COVID-19 pandemic and factors associated with the mental health of dental students. Studies without dental students as participants were excluded. The data were analyzed and presented in a table with the variables of interest: authors, year of publication, country, objective, study design, main results and conclusions. The articles demonstrated the negative impact of COVID-19 on the mental health of dental students. The perception of general mental health was the main factor associated with diagnoses of depression, anxiety and stress. The majority of students reported that online platforms were insufficient for learning clinical skills. In conclusion, the COVID-19 pandemic exerted a negative impact on the mental health of dental students, underscoring the need for public policies and psychological support strategies involving institutional counseling services.

Descriptors: Mental Health. Dental Students. COVID-19.

Impacto de la pandemia causada por SARS-CoV-2 en la salud mental de los estudiantes de la odontología: una revisión integrativa

Resumen

La salud mental de los estudiantes fue impactada por la pandemia provocada por el coronavirus SARS-Cov-2 (COVID-19). El objetivo del estudio fue realizar una revisión integrativa sobre el impacto de la pandemia en la salud mental de los estudiantes. Fueron consultadas las bases de datos PubMed Medline y SciELO, de los cuales se seleccionaron artículos en los idiomas portugués, inglés y español. La estrategia de búsqueda fue compuesta por la combinación de las palabras-clave COVID-19, pandemia, estudiantes de odontología, educación dental y salud mental. Las adquisiciones de los datos fueron realizadas en el mes de agosto de 2021 teniendo como criterios de inclusión, publicaciones de cualquier delineamiento que describiesen el impacto de la pandemia de COVID-19 y factores asociados con la salud mental de estudiantes de odontología. Se excluyeron los artículos que no tenían como participantes del estudio a los estudiantes de odontología. Los datos fueron analizados y presentados en formato de cuadro con las variables de interés como: autor, año, título del artículo, objetivo, delineamiento, resultados principales y conclusiones. Los estudios han demostrado impactos negativos de la COVID-19 en la salud mental de los estudiantes de odontología. La percepción de salud mental general fue el principal factor asociado a los diagnósticos de depresión, ansiedad y estrés. Además, la mayoría de los estudiantes manifestó que utilizar plataformas de aprendizaje virtuales fueron insuficientes para desarrollar competencias clínicas. Cabe concluir que la necesidad de política pública y estrategias de apoyos psicológicos deberían incluir servicios de asesoramiento institucional.

Descriptorios: Salud Mental. Estudiantes de Odontología. COVID-19.

Impacto da pandemia provocada pelo SARS-CoV-2 na saúde mental de estudantes de Odontologia: uma revisão integrativa

Resumo A saúde mental dos estudantes de Odontologia foi impactada pela pandemia provocada pelo coronavírus SARS-CoV-2 (COVID-19). O objetivo do estudo foi realizar uma revisão integrativa sobre o impacto da pandemia na saúde mental de estudantes de Odontologia. Foram consultadas as bases de dados PubMed Medline e SciELO, nas quais foram selecionados artigos nos idiomas em português, inglês e espanhol. A estratégia de busca foi composta pela combinação das palavras-chave COVID-19, pandemia, estudantes de Odontologia, educação odontológica e saúde mental. As coletas foram realizadas no mês de agosto de 2021 tendo como critérios de inclusão os artigos de qualquer delineamento que descrevessem o impacto da pandemia de COVID-19 e fatores associados com a saúde mental de estudantes de Odontologia. O critério de exclusão foi de artigos que não tinham como participantes do estudo os estudantes de Odontologia. Os dados foram analisados e apresentados em formato de quadro com as variáveis de interesse como: autor, ano, país, título do artigo, objetivo, delineamento, resultados principais e conclusões. Os estudos demonstram impactos negativos da COVID-19 na saúde mental dos estudantes de Odontologia. A percepção de saúde mental geral foi o principal fator associado aos diagnósticos de depressão, ansiedade e estresse. Ademais, a maioria dos estudantes afirmou que as plataformas de aprendizagem *online* eram insuficientes para o aprendizado das competências clínicas. Conclui-se que a pandemia de COVID-19 impactou negativamente a saúde mental de estudantes de Odontologia, evidenciando a necessidade de políticas públicas e estratégias de apoio psicológico envolvendo serviços de aconselhamento institucional.

Descritores: Saúde Mental. Estudantes de Odontologia. COVID-19.

INTRODUCTION

The new coronavirus SARS-Cov-2 (COVID-19) triggered and intensified psychiatric disorders in the general population, such as depression, anxiety, stress¹, panic attacks and sleep disorders². A new teaching-learning model was also necessary, which resulted in adaptations on the part of teaching staff and students for the continuation of the educational process in remote format (online). In university courses of the health field, classes were conducted online for many months due to the need for social distancing and students had no physical contact with classmates, professors or patients³.

Remote teaching became routine for students in the health field between 2020 and 2022. However, the return to practical activities was necessary, especially in dental courses. The scientific literature offers reports on how medical and nursing courses were negatively affected by the pandemic, with difficulties and frustrations faced in the adaptation of the routine⁴.

Besides the fear and anguish stemming from the uncertainties involved in the return to face-to-face activities, the beginning of practical classes was also a delicate moment, especially with regards to dental procedures, due to the considerable risk of contamination associated with the production of aerosols.⁵

During the pandemic, protection from the virus was necessary among healthcare providers, with the use of more adequate personal protective equipment (PPE) to avoid the contamination of patients, family members and colleagues. Moreover, changes were needed in terms of biosafety procedures before, during and after appointments, such as changes in scheduling, the cleaning of clinics, the number of appointments per shift, professional conduct, etc.⁶. Various restrictive measures were imposed regarding the circulation of individuals, along with substantial changes in the routine of healthcare providers, especially dentists. The "new normal" was established due to the high incidence of contagion, the high degree of lethality of COVID-19 and the biopsychosocial impacts⁷. Thus, new routines were abruptly established

due to the fact that the virus is easily transmitted by the airways and causes a variety of adverse health outcomes, including death.

All occurrences during the pandemic were unprecedented, acute and intense. In a short span of time, students needed to adopt to online learning distant from the school/university setting. The mental strain was intense due to uncertainties regarding the return to face-to-face activities as well as the fear and anguish related to an unknown involving a high mortality rate. Understanding and identifying factors associated with the impact of the pandemic on the mental health of dental students are fundamental to rebuilding the teaching-learning process with novel teaching proposals. It is also important to establish protection measures and the recovery of mental health in the university setting during this and other pandemics.

Therefore, the aim of the present study was to conduct an integrative review of the literature on the impact of the COVID-19 pandemic on the mental health of dental students.

METHOD

The study design was an integrative review^{8,9}, for which the guiding question was "What was the impact of the pandemic on the mental health of students of dentistry?" The PubMed Medline and SciELO databases were searched in August 2021 for relevant articles published in Portuguese, English and Spanish. No restrictions were imposed regarding study design or year of publication. The search strategy involved the use of the Boolean operators "AND" and "OR" combined with specific complementary tools (quotation marks and parentheses) to find articles. The following search strategy was used: *("COVID-19" OR pandem*) AND ("dental students" OR "dental education") AND ("mental health")*.

Articles that described the impact of the COVID-19 pandemic on the mental health of undergraduate students of dentistry were included. Articles involving undergraduate students of other fields of knowledge and graduate students of dentistry were excluded.

A trained researcher performed the searches of the databases and created a databank with all articles retrieved during the search. The researcher then read the titles and abstracts of the studies and those that met the inclusion criteria were submitted to full-text analysis.

The researchers created a synthesis table with the following variables of interest: author/year, country, title of article, objective, study design, main results of each study and conclusions. It was therefore possible to analyze and interpret the findings of the articles selected for the review.

RESULTS

Eleven articles were found in the PubMed database and one was found in SciELO. There was no need for the removal of duplicates. After the full-text analysis of all articles, three were excluded for not involving dental students. Thus, eight articles were included in the present integrative review (Figure 1). The variables of interest (author/year/country, title, objective, study design, results and conclusion) are displayed in Table 1. The majority of studies was from Saudi Arabia and the cross-sectional design was the most prevalent. The samples ranged from 211 to 2036 participants.

The analyses of the studies revealed that the COVID-19 pandemic exerted an impact on overall mental health and the clinical psychosocial skills of the dental students. Most students stated that online learning platforms were insufficient for the development of clinical skills. Moreover, the pandemic altered prospects for the post-graduation career and the dental students feared exposure to the virus during the performance of their profession. Anxiety and depression were the factors that most influenced the intention to drop out of the undergraduate course.

The most prevalent factors associated with the impact on the mental health of the dental students were concerns with regards to professional growth, setbacks in clinical experience, a past history of mental health problems, fear of being contaminated by patients, income level, assisting in the care of older people in the home and coffee intake. Moreover, being a female student, single individual and student at the beginning of the course were associated with higher levels of depression, anxiety and stress.

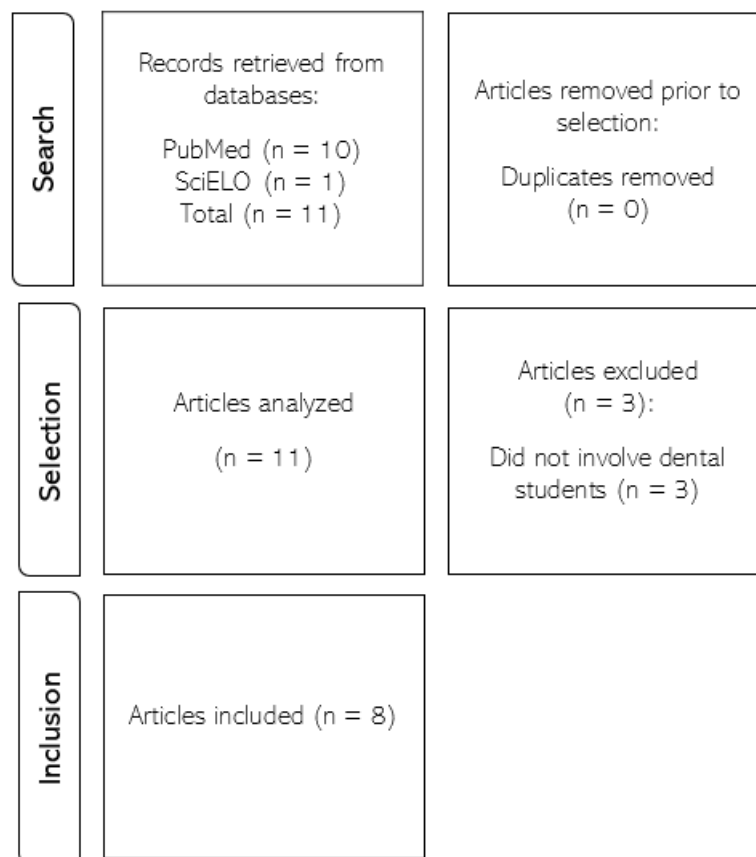


Figure 1. Flowchart of article selection process.

DISCUSSION

The understanding of health is closely linked to social determinants, which are represented by factors related to lifestyle, social and community networks, working environment, educational level, access to foods, etc., in other words, everything linked to socioeconomic, cultural and environmental aspects, as demonstrated by the Dahlgren and Whitehead diagram adapted by the World Health Organization¹⁸. The university community is especially vulnerable to physical and psychological strain that can exert negative impacts on quality of life, such as irritability, insomnia, fatigue, difficulty making decisions and difficulty concentrating, which can lead to negative psychological outcomes of impotence, feelings of guilt, fear of making mistakes, anxiety, depression and even suicide¹⁹. Considering this worrisome mental health scenario that affects students, the analysis of the mental health of dental students can contribute to the establishment of strategies for improving their academic and social performance.

Dental students will go on to play their social role understanding the relationship between dentists and health and especially oral health. One's professional performance goes beyond prevention and rehabilitation and also focuses on shared, intersectoral and interprofessional health promotion actions. However, the social aspect of education does not justify deficient clinical/scientific training. Clinical practice of quality must be linked to and in synergy with knowledge on social and environmental aspects as well as national and international political aspects, as exemplified by the phenomenon of the pandemic. Thus, the regulation/management of the education process for dental students should include care for their mental health in the educational setting, considering their social function of transforming and recovering the "systemic-social-environmental-mental-political" health of modern society.

Table 1. Characterization of articles included in present integrative review.

Author/year	Title	Objective	Design	Results
Hakami Z, 2021.	Effects of COVID-19 lockdown on the mental health of dental students: A longitudinal study.	Assess the effects of lockdown on dental students.	Longitudinal study with sample of 1287 participants (695 interviewed in first survey, 592 interviewed in second survey).	A significant longitudinal difference was found in the mental health of the students. The lockdown increased the likelihood that female students, single students and students at the beginning of the course experienced stress. Students that lived alone had a greater likelihood of having high levels of depression, anxiety and stress. The lockdown also increased the likelihood of mental health problems in students who lived with 2 or 2-5 people.
Mekhemar M, 2021.	Dental Students in Germany throughout the COVID-19 Pandemic: A Psychological Assessment and Cross-Sectional Survey.	Examine associations between psychological characteristics and sociodemographic factors among dental students at German universities.	Cross-sectional study with 211 participants (dental students).	The students reported general, normal or mild levels of depression, anxiety, stress, intrusion, truancy and overexcitation. The female sex, cardiovascular disease, smoking and seeing the COVID-19 as a financial risk were factors associated with a significant increase in the occurrence of depression, anxiety and stress.
Alrashed FA, 2021.	Implications of the COVID-19 Pandemic on the Mental Health and Professional Psychomotor Skills of Dental Students.	Investigate self-rated mental wellbeing among dental students and the effects on clinical psychomotor skills after they (or their family members) were infected by COVID-19.	Cross-sectional study with sample of 268 participants (dental students).	Students who were infected by COVID-19 (54.3%) reported that their clinical psychomotor skills were significantly affected (nearly four times more) in comparison to others. 42.2% of the students reported that infection control measures at the clinics resulted in significant psychological disorders for those who were infected with COVID-19. 45.1% of the students also reported having difficulty recalling old memories or information due to the COVID-19 pandemic; 46.7% of these students were exposed or had a family member exposed to the virus.
León-Manco RA, 2021.	Perceived Stress in Dentists and Dental Students of Latin America and the Caribbean during the Mandatory Social Isolation Measures for the COVID-19 Pandemic: A Cross-Sectional Study.	Determine the impact of the COVID-19 pandemic, specifically considering measures of mandatory social isolation implemented, on perceived stress in a sample of dentists and dental students in Latin America and the Caribbean as well as associations with sociodemographic aspects and variables related to the pandemic.	Cross-sectional study with sample of 2036 participants (724 students and 1312 dentists).	Hierarchical linear regression models showed that the lower level of income during social isolation, assisting in care for older people in the home during mandatory social isolation, a higher level of self-perceived worry about COVID-19, poorer self-rated health and high coffee intake were significantly associated with the increase in the score on the Perceived Stress Scale.
Chi DL, 2021.	Dental trainees' mental health and intention to leave their programs during the COVID-19 pandemic.	Estimate the prevalence of mental health problems and determine the extent to which poor mental health and the COVID-19 pandemic were related to the intention to drop out of dental school.	Cross-sectional study with sample of 355 participants (dental students).	12.7% of interns reported the intention to drop out of the program. 22.2% and 16.7% confirmed clinically significant symptoms of anxiety and depression, respectively. 28.6% reported one or more symptoms of burnout and 69% reported that COVID-19 affected their general mental health. Participants who reported anxiety (OR = 8.87; 95% CI: 1.80 - 43.57; p = 0.007), depression (OR = 11.18; 95% CI: 1.84 - 67.74; p = 0.009) or

					burnout (OR = 8.14; CI 95%: 1.73 - 38.23; p = 0.008) were significantly more likely to report the intention to leave school than those who did not report mental health problems. All participants who reported that the COVID-19 pandemic exerted an impact on their mental health expressed the intention to drop out.
Chakraborty T, 2020.	Psychological Distress during COVID-19 Lockdown among Dental Students and Practitioners in India: A Cross-Sectional Survey.	Screen for depression during the lockdown due to COVID-19 and determine associations among dental students and dentists in states highly infected with COVID-19 in India.	Cross-sectional study with sample of 335 participants (dental students and dentists).		54% of the dental students and 44% of the dentists had scores of moderate to severe depression. Most of those identified as depressive were male and less than 30 years of age. Concerns with professional growth, setbacks in clinical experience and research, a previous history of mental health problems and fear of contracting COVID-19 from patients were positively associated with higher depression scores in the students. For dentists, fear of contracting COVID-19 from patients resulted in higher levels of depression. Dentists reported less concern with their clinical practice/work after the lockdown and those who were able to cover their financial expenses during the lockdown were less likely to be depressed.
Hakami Z, 2021.	Psychological impact of the coronavirus disease 2019 (COVID-19) pandemic on dental students: A nationwide study.	Assess the psychological impact of the pandemic on dental students in Saudi Arabia.	Cross-sectional study with sample of 697 participants (dental students).		Significant differences in mental health results were evident with regard to gender, university and time of study. High levels of depression (60.64%), anxiety (37.02%) and stress (34.92%) were found among the students. Women, students who lived alone and those in the third year of the course were more likely to have psychological problems during the COVID-19 pandemic.
Gül Keskin, 2021.	Self-Report Measurement of Depression, Anxiety, and Stress Caused by COVID-19 Pandemic in Senior Undergraduate Dental Students.	Assess the effect of the COVID-19 pandemic on the mental health of dental students in the last year of the course, measuring levels of depression, anxiety and stress.	Cross-sectional study with sample of 259 participants (dental students).		The students stated that online teaching platforms were insufficient for developing clinical skills (91.5%) and that the COVID-19 pandemic brought changes in career prospects, with a preference to continue one's education through graduate courses (29.3%). The students feared exposure to COVID-19 in the performance of their profession (82.6%). The prevalence of mild to extremely severe depression, anxiety and stress was 82.1%, 79.6% and 72.9%, respectively. Average scores for all aspects of depression, anxiety and stress were higher among women than men (p < 0.05).

Dental care always required an infection control protocol due to the large number of diseases that can be transmitted during dental procedures. With the pandemic caused by SARS-CoV-2, a new, more rigid protocol was established, as the production of aerosols occurs in a large part of clinical procedures, making atmospheric contamination a considerable risk factor for cross infection²⁰. The *Associação Brasileira de Ensino Odontológico* (ABENO [Brazilian Dental Teaching Association]) issued a document with nine guidelines to be implemented at dental schools in Brazil to mitigate the contamination process. The document describes actions that begin with the scheduling process though to conduct during appointments. Moreover, a document was created in a collaborative effort by a team of professors of several Brazilian universities under the leadership of ABENO and served as the driving force to reorganize biosafety actions, enabling the academic community to return to laboratory and clinical activities safely. It is possible that this work conducted by ABENO may have exerted an influence on levels of anxiety, stress and depression for some of the students as a result of the changes in relation to the physical aspect of clinics at universities and patient management. On the other hand, some members of the academic community may have been relieved by the return to activities, even without vaccinal protection in the "new normal"⁶.

As a result of the adaptations required to the working process, the main mental health diagnoses were depression²¹, stress²² and anxiety²³. The findings demonstrate the presence of factors associated with mental health problems in one or more of the studies included in this integrative review, such as concerns with professional growth, setbacks in clinical experience, a previous history of mental health problems and fear of being contaminated by patients. With regards to diagnoses of stress, factors such as assisting in the care of older people in the home, a higher level of worry with COVID-19, self-rated general health as poor, coffee intake, income level, the female sex, being single and being at the beginning of the course were strongly associated. However, students who lived alone were at greater risk of developing depression, anxiety and stress.

Fear was related to the negative situations experienced during the pandemic, such as financial strain, the intense number of hospitalized patients, deaths and social isolation. Moreover, the establishment of remote classes and the interruption of practical classes in the academic environment of dental courses exerted negative impacts on the learning of theory and clinical practice. Such changes may have caused a certain degree of depression, anxiety and stress in the students during the peak of the pandemic as well as during the return to academic activities. In this context, the dental academic community sought to establish new learning protocols/routines, especially at clinics, to mitigate the transmission of the virus among social actors (students, professors, patients and family members). With these new routines in dental courses, especially in laboratories and clinics, activities were taken up again slowly and gradually, which provided the students with the time to learn to face their anguish, frustrations and fears.

A factor with a positive impact on mental health, altering aspects of depression and anxiety, may have been the implementation of vaccination campaigns, with corresponded to an average 30% reduction in the symptoms of these disorders²⁴. Globally, the SARS-CoV-2 vaccine represented, represents and will represent an important health policy. Thus, the National Mental Health Policy implemented by the Health Ministry²⁵ needs to be revised²⁶ to address the mental health needs of Brazilian students. This is not a new subject, but discussion is currently bolstered by an unprecedented pandemic. Hence, the university community requires this policy to include actions promoted by health and education administrators in the respective ministries as well as the administration of public and private universities, with an emphasis on psychoeducational care.

Based on the present results, students and educators seem to be adapting. Understanding factors associated with the mental health of students can assist in the establishment of psychoeducational support and improve academic performance. The offer of psychological support to students is necessary, with approaches that assess the limitations imposed by the pandemic. There is a need to develop methods for recovering psychosocial and clinical skills with the aim of producing professionals capable of overcoming their own adversities as well as those encountered in the work performed. It is also necessary to give students decision-making skills that can be employed in difficult situations.

During the return to academic activities, a better understanding was needed of the factors of greater impact on the mental health of students, such as concerns for professional growth, setbacks in clinical experience, a previous history of frail mental health and fear of contracting the virus from patients. Furthermore, students with a lower income level,

those that assist in caring for older people in their homes and those with a negative self-perception of their own health require individualized care. It is also important to be aware that female students, single students and those at the beginning of the course have higher levels of depression, anxiety and stress. Thus, the teaching staff of dental courses must understand the fears involved and the individual limitations of each student. This will make it possible to plan and offer psychological support and teaching reinforcement actions, as the pandemic had an impact on the mental health of students and was a world event that affected the entire population.

The present study has limitations that should be considered. Only one author selected the articles for inclusion in the review and no meetings were held with the other researchers in this regard. Moreover, the level of evidence of the studies included as low, as only one study had a longitudinal design. Qualitative studies could help clarify issues with regards to perceptions on the part of dental students of their post-pandemic mental health, main losses in terms of the learning process and social advances that the pandemic left for their educational process. There is much to explore with regards to mental health during and after an education in dentistry to gain an understanding and translate the experience into reflexive actions of socio-professional development.

CONCLUSION

The present findings suggest that the COVID-19 pandemic was negatively associated with the mental health of dental students, as demonstrated by the occurrence of depression, anxiety and stress. Thus, public policies and psychological support strategies involving institutional counseling services are needed.

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