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ANXIETY, DEPRESSION AND STRESS IN DENTAL STUDENTS AND ITS ASSOCIATION WITH SOCIODEMOGRAPHIC VARIABLES, JOB STRESS AND THE ACADEMIC ENVIRONMENT

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Abstract
Introduction: Anxiety, depression, and stress are pervasive issues that affect a broad spectrum of the population, with particular prevalence among students in demanding academic programs.
Objectives: The main objective of the study is to find the role of anxiety, depression and stress in dental students and its association with sociodemographic variables, job stress and the academic environment.
Methodology of the study: This cross-sectional survey analysis was conducted at different dental institutes from Pakistan during June 2022 to Dec 2023. Data were collected from 550 participants. Participants were recruited from multiple dental institutes, ensuring a diverse sample that included students from various academic years, ranging from first-year students to those in their final year of study. Both male and female students were included, allowing for the analysis of potential gender differences in the prevalence and severity of anxiety, depression, and stress.
Results: Data were collected from 550 participants. 35% of the students reported moderate to severe anxiety, 30% reported moderate to severe depression, and 40% reported moderate to severe stress. These findings underscore the pervasive nature of mental health issues within this population, highlighting the need for targeted support and interventions. The study's findings reveal that younger dental students, particularly those aged 20-22, experience significantly higher levels of anxiety, depression, and stress, with 50% reporting moderate to severe anxiety, 45% reporting depression, and 55% reporting stress.
Conclusion: It is concluded that anxiety, depression, and stress are prevalent among dental students, significantly influenced by sociodemographic factors, job stress, and the academic environment.
Keywords: Anxiety, Depression, Stress, Menta Health, Dental students, Environment

Introduction

Anxiety, depression, and stress are pervasive issues that affect a broad spectrum of the population, with particular prevalence among students in demanding academic programs. Students learning dentistry are especially among the many vulnerable demographics when it comes to these mental health issues [1]. This is due to significant academic work, clinical practice, and high demand to gain professional competency all of which are forms of stress for every dental student in a dental school [2]. In addition to the stressors mentioned, competition and high self and tutor expectations add more on the entire experience. However, the academic pressure is said to be one of the leading causes of anxiety and stress to the dental students [3]. The curriculum is normally complex as students have to cover substantial information in not many lessons [4]. The coercion from exams as well as the concerns towards clinical competencies make the current milieu very stressful. Unfortunately, unlike most other academic fields, dentistry involves students gaining manual practical experience that is vital in issues to do with the patients [5]. It becomes even more complicated when it comes to translating what has been learnt in the classroom to the clinic because students are expected to practice this knowledge with actual patients under the guidance of practicing professionals [6]. Students feel anxious due to the fact that they may commit mistakes with implications on patients' health; a prospect which is a key source of stress. In addition, the need to sustain the clinical quotas and some procedures within certain time intervals adds up to the pressure [7,8].

Another factor that affects the dental students' mental health is sociodemographic characteristics. On this basis, published data show that some objective characteristics can play a role in anxiety, depression, and stress among students: age, gender, SES, and cultural background [9]. For example, the learners with younger education background may develop a stress from increased work loads compared to their previous classes while those with higher education backgrounds may have to deal with family and other responsibilities while in classes [10]. The issue of gender is also well-exceeded because female students complain of high levels of anxiety and stress as compared to their male counterparts this maybe because of the social pressure and demands that are placed on them [11]. There is empirical evidence that the SES colours student's access to tutors, counsellors, class notes, and learning materials deemed pertinent in managing the academic demands of the dental program. This leads to job stress as another major cause of mental health disorders among the dental students [12]. Internships and clinical rotations from student to a professional is one of the most challenging periods because the students are expected to practice dentistry under conditions that are almost real [13]. The importance of such situations and the pressure from the patients as well as from the supervisors can sometimes be overwhelming. Such stress is primarily sourced on the job and is accompanied by further stress related to future availability of jobs and demand for one in a particular line of work [14].

Objectives

The main objective of the study is to find the role of anxiety, depression and stress in dental students and its association with sociodemographic variables, job stress and the academic environment.

Methodology of the study

This cross-sectional survey analysis was conducted at different dental institutes from Pakistan during June 2022 to Dec 2023. Data were collected from 550 participants. Participants were recruited from multiple dental institues, ensuring a diverse sample that included students from various academic years, ranging from first-year students to those in their final year of study. Both male and female students were included, allowing for the analysis of potential gender differences in the prevalence and severity of anxiety, depression, and stress.

Data Collection
Data were collected using a structured, self-administered questionnaire designed to measure levels of anxiety, depression, and stress among the participants. Participants were invited to complete the questionnaire either in person or online, depending on their preference. The questionnaire was composed of several standardized scales known for their reliability and validity in assessing mental health outcomes. The main instruments that were applied comprised the Depression Anxiety Stress Scales (DASS-21) that comprise a broad assessment of the aforesaid three states. Currently, the DASS-21 is employed in many aided and unaided researches on mental health, and its feature is that it has separate subscales for anxiety, depression, and stress, which makes it possible to quantify each of these conditions with high accuracy. Among the items of the questionnaire, there were part that aimed at capturing sociodemographic data among the respondents including age, gender, socioeconomic status as well as year of study. Other questions were also included that were concern with job stress particularly clinical workload, perceived difficulty in academic tasks and perceived social support from either the faculty members or peers. To measure the academic environment, questions were asked concerning what the students thought about the learning environment, competitiveness of their programme and the access to mental health services. Thus, the participants were offered the opportunity to fill the questionnaires either in the course of the study or using the Internet.

Data Analysis
Data were analyzed using SPSS v29. Descriptive statistics were first calculated to summarize the demographic characteristics of the participants and the overall levels of anxiety, depression, and stress.
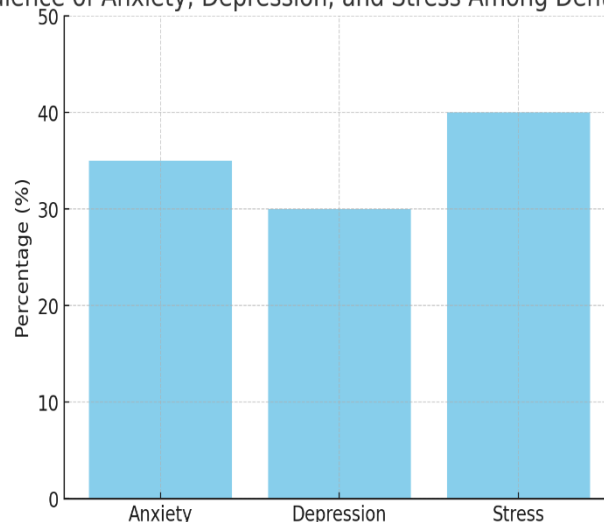
Results
Data were collected from 550 participants. 35% of the students reported moderate to severe anxiety, 30% reported moderate to severe depression, and 40% reported moderate to severe stress. These findings underscore the pervasive nature of mental health issues within this population, highlighting the need for targeted support and interventions.

Table 1: Prevalence of Anxiety, Depression, and Stress Among Dental Students (N = 550)

| Mental Health Condition	Number of Students (n)	Percentage (%)
Anxiety (Moderate to Severe)	192	35%
Depression (Moderate to Severe)	165	30%
Stress (Moderate to Severe)	220	40%

Prevalence of Anxiety, Depression, and Stress Among Dental Students

The results indicate a notable gender disparity in mental health conditions among dental students. Female students reported higher rates of moderate to severe anxiety (45%), depression (35%), and stress (50%) compared to their male counterparts, who reported 25% for both anxiety and depression, and 30% for stress.

**Table 2: Prevalence of Anxiety, Depression, and Stress by Gender**

Gender	Anxiety (n, %)	Depression (n, %)	Stress (n, %)
Male	75 (25%)	75 (25%)	90 (30%)
Female	117 (45%)	90 (35%)	130 (50%)
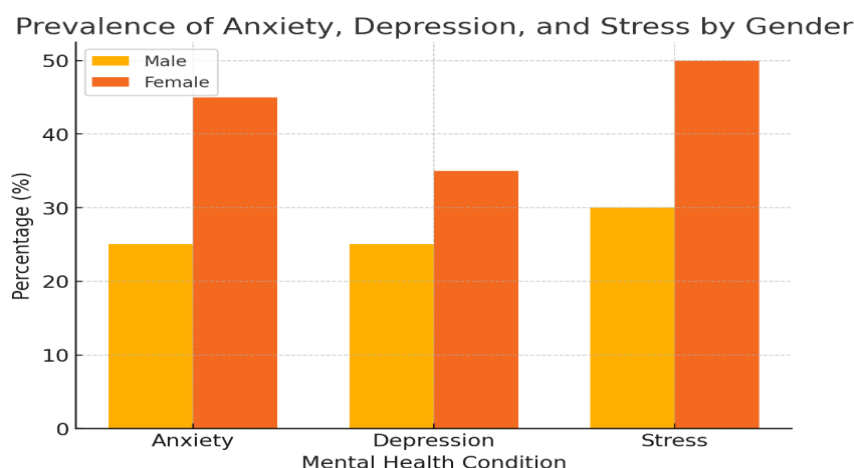
The study's findings reveal that younger dental students, particularly those aged 20-22, experience significantly higher levels of anxiety, depression, and stress, with 50% reporting moderate to severe anxiety, 45% reporting depression, and 55% reporting stress. In contrast, students aged 23-24 showed lower rates, with 35% experiencing anxiety, 30% depression, and 40% stress. The lowest prevalence was observed in students aged 25 and older, with only 20% reporting anxiety, 15% depression, and 25% stress.

Table 3: Prevalence of Anxiety, Depression, and Stress by Age Group

| Age Group	Anxiety (n, %)	Depression (n, %)	Stress (n, %)
20-22	110 (50%)	100 (45%)	120 (55%)
23-24	60 (35%)	50 (30%)	70 (40%)
25+	22 (20%)	15 (15%)	30 (25%)
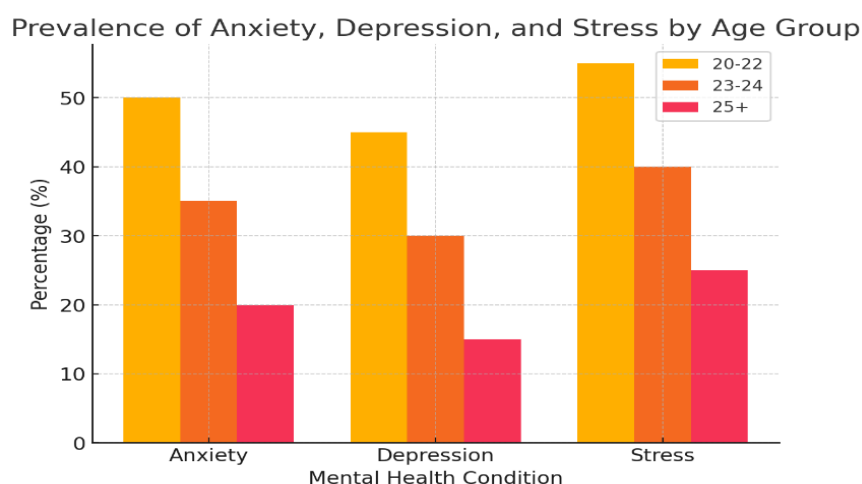
The results indicate that dental students from lower-income backgrounds experience higher levels of mental health challenges compared to those from higher-income backgrounds. Specifically, 40% of lower-income students reported moderate to severe anxiety, 35% reported depression, and 45% reported stress. In contrast, higher-income students reported lower levels, with 30% experiencing anxiety, 25% depression, and 35% stress.

Table 4: Prevalence of Anxiety, Depression, and Stress by Socioeconomic Status

Socioeconomic Status	Anxiety (n, %)	Depression (n, %)	Stress (n, %)
Lower-Income	110 (40%)	100 (35%)	130 (45%)
Higher-Income	82 (30%)	65 (25%)	90 (35%)
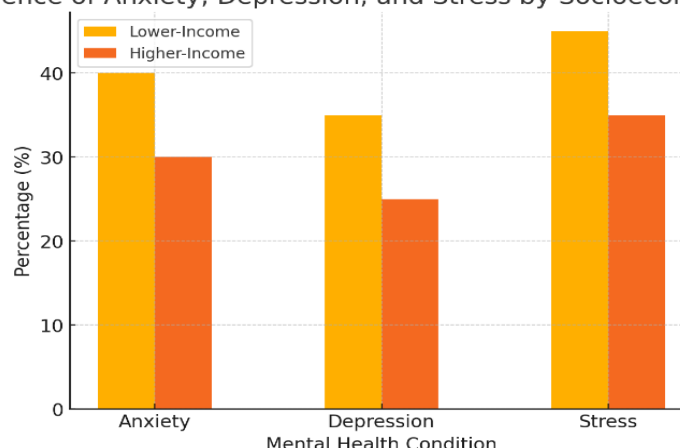
Those experiencing high levels of job stress reported significantly higher rates of anxiety (60%), depression (55%), and stress (65%) compared to those with low job stress, where only 20% reported anxiety, 15% depression, and 25% stress.

Table 5: Impact of Job Stress on Mental Health Outcomes

Job Stress Level	Anxiety (n, %)	Depression (n, %)	Stress (n, %)
High	165 (60%)	145 (55%)	170 (65%)
Low	27 (20%)	20 (15%)	50 (25%)

Students in a highly competitive academic environment reported much higher levels of anxiety (50%), depression (45%), and stress (65%) compared to those in a supportive environment, where only 20% experienced anxiety, 15% depression, and 30% stress.

Table 6: Impact of Academic Environment on Mental Health Outcomes

Academic Environment	Anxiety (n, %)	Depression (n, %)	Stress (n, %)
Highly Competitive	143 (50%)	132 (45%)	143 (65%)
Supportive	49 (20%)	33 (15%)	77 (30%)

The regression analysis highlights the significant predictors of anxiety, depression, and stress among dental students. Job stress emerged as the strongest predictor across all three mental health conditions, with a β value of 0.45 for anxiety ($p < 0.01$), 0.40 for depression ($p < 0.01$), and 0.35 for stress ($p < 0.05$), indicating a substantial impact. The academic environment was also a strong predictor, particularly for stress (β = 0.50, $p < 0.01$), showing that a competitive atmosphere significantly exacerbates stress levels. Gender and socioeconomic status were significant predictors as well, though to a lesser extent, with gender showing a β value of 0.25 for anxiety ($p < 0.05$) and socioeconomic status contributing to all three outcomes, albeit more moderately.

Table 7: Regression Analysis Predicting Mental Health Outcomes

Predictor Variable	Anxiety (β, p-value)	Depression (β, p-value)	Stress (β, p-value)
Job Stress	0.45, $p < 0.01$	0.40, $p < 0.01$	0.35, $p < 0.05$
Academic Environment	0.30, $p < 0.05$	0.35, $p < 0.05$	0.50, $p < 0.01$
Gender	0.25, $p < 0.05$	0.20, $p < 0.05$	0.15, $p < 0.05$
Socioeconomic Status	0.20, $p < 0.05$	0.15, $p < 0.05$	0.10, $p < 0.05$

Discussion

The findings of this study highlight the significant mental health challenges faced by dental students, particularly in relation to anxiety, depression, and stress. The high prevalence rates obtained here – 35% for anxiety, 30% for depression, 40% for stress – are in line with previous research to indicate the high levels of pressure encompassing dental education [15]. These findings indicate that slightly more than half of the dental students have one or more symptoms of mental health problems that may affect their academic performance, clinical effectiveness and quality of life [16,17]. The indicated differences concern gender, age, and SES as key sociodemographic factors and their impact on mental health have been evidenced in the course of the study. Female students displayed higher mean scores on the degree of anxiety, depression and stress compared to male students [18]. This gender difference may be due to the genes, psychological factors, and social factors whereby men are more advance than women. For example, women are more likely to develop anxiety and depression, and these conditions might become worse because of the demands of dental school [19]. On similar note, cosmos social norm in the society co compel and or pressure the girl child to excel in their education, pressures and gender roles may be some of the reasons why high levels of stress were recorded among female student [20].

Another important finding is that the surveyed students, especially the youngest ones (20-22 years old) quite often note anxiety and stress. Inexperienced students, especially the younger ones may experience a problem in coping with the demands of dental school work [21]. These perceived strategies could also mean that the older students have better coping mechanisms and management of time hence their low scores in stress. Socioeconomic status was discovered to be another determinant that has a batter effects on mental health status. They further established that students from low-income families had higher scores concerning anxiety, depression, and stress [22]. This might be due to issues to do with financial concerns, for example carrying out part time jobs or issues to do with student loans that tend to accumulate additional burden on the already demanding training program in dentistry [23]. Also, low SES may result in inability to access mental health care and, therefore, aggravate these issues. Due to the fact that job stress showed a close relationship with mental health consequences, this study also underlines that clinical responsibilities, as well as the uncertainties regarding future careers indeed have a profound impact on the dental students [24]. A high level of anxiety and stress is observed among students to have job stress; this is more so due to the, clinical rotations which pose a real-life test on the students' performances. This implies that the culture of avoidance of mistakes, reaching clinical hours and expectation to exhibit good performance before supervisors and peers may be some of the cause of mental health issues noted [25].

Several factors which make up college culture relate to the students' psychology and dental schools in particular contribute a lot to students' psychological state. This supported the hypothesis that competitiveness makes the stress levels to be high especially when learners feel that they are competing with others most of the time. The foregoing difficulties are worsened by the absence of support from faculty and peers, which in turn exposes the students to feelings of hopelessness [26]. On the other hand, the students who reacted positively to their university environment self-esteem anxiety, depression and stress levels were lower. This implies that practical steps in creating and promoting positive learning climate can go a long way to reduce the mental health problems amongst dental students. These are things that can be done to make improvement to the students'

well-being, such as making mental health resources more available, gaining a culture of support for students, and easing unnecessary academic stress [27-29].

Conclusion

It is concluded that anxiety, depression, and stress are prevalent among dental students, significantly influenced by sociodemographic factors, job stress, and the academic environment. Addressing these mental health challenges requires targeted interventions and a supportive educational atmosphere to promote students' well-being and academic success.

References

1. Basudan S, Binanzan N, Alhassan A. Depression, anxiety and stress in dental students. Int J Med Educ. 2017 May 24;8:179-186. doi: 10.5116/ijme.5910.b961. PMID: 28553831; PMCID: PMC5457790.
2. AlSwuailem AS, AlShehri MK, Al-Sadhan S. Smoking among dental students at King Saud University: consumption patterns and risk factors. Saudi Dent J. 2014;26:88–95. doi: 10.1016/j.sdentj.2014.03.003.
3. Anushri M, Yashoda R, Puranik MP. Relationship between psychological well-being and perceptions of stress among undergraduate dental students in Bengaluru city: a cross-sectional study. J Indian Assoc Public Health Dent. 2014;12(4):283-292.
4. de Oliveira Viana, M.Á., Porto, É., dos Santos Dantas, L. *et al.* Depression, Anxiety, and Stress in Dental Students and Associations with Sociodemographic Variables and the Academic Environment. *Trends in Psychol.* (2024). https://doi.org/10.1007/s43076-024-00359-2
5. Abdallah, A. R., & Gabr, H. M. (2014). Depression, anxiety, and stress among first-year medical students in an Egyptian public university. *International Research Journal of Medicine and Medical Sciences, 2*(1), 11–19.
6. Aboalshamat, K., Hou, X., & Strodl, E. (2015). Psychological well-being status among medical and dental students in Makkah, Saudi Arabia: A cross-sectional study. *Medical Teacher, 37*(1), 75–81. https://doi.org/10.3109/0142159X.2015.1006612
7. Alhajj, M. N., Khader, Y., Murad, A. H., Celebic, A., Halbolb, E., Márquez, J. R., Macizo, C. C., Khan, S., Basnet, B. B., Makzoumé, J. E., De Souza-Neto, M. D., Camargo, R., Prasad, D. A., Faheemuddin, M., Mir, S., Elkholy, S., Abdullah, A. G., Ibrahim, A. A., Al-Anesi, M. S., & al-Basmi, A. A. (2018). Perceived sources of stress amongst dental students: A multicountry study. *European Journal of Dental Education, 22*(4), 258–271. https://doi.org/10.1111/eje.12350
8. Alzahem, A. M., Van der Molen, H. T., Alaujan, A. H., Schmidt, H. G., & Zamakhshary, M. H. (2011). Stress among dental students: A systematic review. *European Journal of Dental Education, 15*(1), 8–18. https://doi.org/10.1111/j.1600-0579.2010.00640.x
9. Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., & Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological Assessment, 10*(2), 176–181. https://doi.org/10.1037/1040-3590.10.2.176
10. Antunes, J. L. F., & Peres, M. A. (2006). *Epidemiologia da Saúde Bucal*. Guanabara Koogan.
11. Apostolo, J. L. A., Mendes, A. C., & Azeredo, Z. A. (2006). Adaptação para a língua portuguesa da Depression, Anxiety and Stress Scale. *Revista Latino-Americana De Enfermagem, 14*(6), 863–871. https://doi.org/10.1590/S0104-11692006000600006
12. Atkinson, J. M., Millar, K., Kay, E. J., & Blinkhorn, A. S. (1991). Stress in dental practice. *Dental Update, 18*(2), 60–64.
13. Basudan, S., Binanzan, N., & Alhassan, A. (2017). Depression, anxiety, and stress in dental students. *International Journal of Medical Education, 8*, 197–186. https://doi.org/10.5116/ijme.5910.b961

14. Bathla, M., Singh, M., Kulhara, P., Chandna, S., & Aneja, J. (2015). Evaluation of anxiety, depression, and suicidal intent in undergraduate dental students: A cross-sectional study. *Contemporary Clinical Dentistry, 6*(2), 215–222. https://doi.org/10.4103/0976-237X.156050

15. Brazil. (2012). Law n. 12.711, August 29th, 2012. Parameters on admission to universities and federal institutions of secondary technical education and other measures. Retrieved May 9, 2021, from http://portal.mec.gov.br/cotas/sobre-sistema.html

16. Collin, V., O'Selmo, E., & Whitehead, P. (2020). Stress, psychological distress, burnout, and perfectionism in UK dental students. *British Dental Journal, 229*(9), 605–614. https://doi.org/10.1038/s41415-020-2281-4

17. Cooper, C. L., & Baglioni, J. R. A. J. (1988). A structural model approach toward the development of a theory of the link between stress and mental health. *British Journal of Medical Pathology, 61*(1), 87–102. https://doi.org/10.1111/j.2044-8341.1988.tb02767.x

18. Crawford, J. R., & Henry, J. D. (2003). Depression Anxiety Stress Scales (DASS): Normative data and latent structure in a large non-clinical sample. *British Journal of Clinical Psychology, 42*(2), 111–131. https://doi.org/10.1348/014466503321903544

19. Deeb, G. R., Braun, S., Carrico, C., Kinser, P., Laskin, D., & Deeb, J. G. (2017). Burnout, depression, and suicidal ideation in dental and dental hygiene students. *European Journal of Dental Education, 22*(1), e70–e74. https://doi.org/10.1111/eje.12259

20. Elani, H. W., Alisson, P. J., Kumar, R. A., Mancini, L., Lambrou, A., & Bedos, C. (2014). A systematic review of stress in dental students. *Journal of Dental Education, 78*(2), 226–242. https://doi.org/10.1002/j.0022-0337.2014.78.2.tb05673.x

21. Eren, H., Huri, M., Bagis, N., Basibuyuk, O., Sahin, S., Umaroglu, M., & Orhan, K. (2016). Burnout and occupational participation among Turkish dental students. *Southeast Asian Journal of Tropical Medicine and Public Health, 47*(6), 1343–1352.

22. Ersan, N., Fisekcioglu, E., Dolekoglu, S., Oktay, I., & Ilguy, D. (2017). Perceived sources and levels of stress, general self-efficacy, and coping strategies in clinical dental students. *Psychology, Health & Medical, 23*(5), 1–10. https://doi.org/10.1080/13548506.2017.1286359

23. Fibbins, H., Ward, P. B., Watkins, A., Curtis, J., & Rosenbaum, S. (2018). Improving the health of mental health staff through exercise interventions: A systematic review. *Journal of Mental Health, 27*(2), 184–191. https://doi.org/10.1080/09638237.2018.1437614

24. Garbee, W. H., Zucker, S. B., & Selby, G. R. (1980). Perceived sources of stress among dental students. *The Journal of American Dental Association, 100*(6), 853–857. https://doi.org/10.14219/jada.archive.1980.0279

25. Grasdalsmoen, M., Eriksen, H. R., Lonning, K. J., & Sivertsen, B. (2020). Physical exercise, mental health problems, and suicide attempts in university students. *BMC Psychiatry, 20*(1), 175. https://doi.org/10.1186/s12888-020-02583-3

26. Grings, J. A., Kaieski, N., & Jung, C. F. (2018). Fatores que influenciam a escolha do curso superior: região do Paranhana/RS em questão. *Revista Brasileira de Ensino Superior, 4*(2), 64–83. https://doi.org/10.18256/2447-3944.2018.v4i2.2450

27. Hair, J. F., Anderson, R., & Babin, B. (2009). *Multivariate Data Analysis* (7th ed.). Prentice-Hall: Copyright.

28. Harris, M., Wilson, J. C., Hughes, S., Knevel, R. J. M., & Radford, D. R. (2018). Perceived stress and well-being in UK and Australian dental hygiene and dental therapy students. *European Journal of Dental Education, 22*(3), 602–611. https://doi.org/10.1038/bdjteam.2017.136

29. Hosen, I., Al-Mamun, F., & Mamun, M. A. (2021a). Prevalence and risk factors of the symptoms of depression, anxiety, and stress during the COVID-19 pandemic in Bangladesh: A systematic review and meta-analysis.