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ANXIETY, DEPRESSION AND STRESS RELATED TO QUALITY OF LIFE IN DENTISTRY STUDENTS AT A COLOMBIAN CARIBBEAN UNIVERSITY

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ABSTRACT

Introduction: Dentistry is a highly complex field; therefore, students are constantly subjected to significant mental and physical demands, in addition to other factors that generally affect university students. In this regard, it has been observed that some students experience difficulties during their academic training, which has translated into mental health disorders. Consequently, it is necessary for dental programs to be aware of the psychological state of their students to take appropriate action.

Objective: To estimate the levels of anxiety, stress, and depression among students in the Dentistry Program at Universidad del Sinú, Colombia, during the process of acquiring clinical competencies, and to analyze their relationship with quality of life and well-being.

Materials and Methods: This was an analytical observational study. Scales were used to measure stress, anxiety, depression, quality of life, and subjective well-being in dental students. Data analysis was performed using Spearman correlation for non-parametric data.

Results: The SSP-14 scale identified that 10.66% of the students had low levels of stress, 88.6% moderate, and 1.69% high. The Spearman correlation did not show a significant relationship between quality of life and the other variables evaluated.

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Conclusion: The population of clinical practice dental students presents very high levels of stress, anxiety, and depression despite reporting a good quality of life.

Keywords: Psychological stress. Anxiety. Depression. Quality of life. Social well-being. Dental students (DeSC).

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INTRODUCTION

In the World Health Organization (WHO) report *"Mental Health in the World"*, mental health is described as: "A state of well-being in which the individual realizes their own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to their community." This report states that around 450 million people worldwide experience mental disorders, of which only a small minority receive therapy (1,2).

It has been reported that mental health issues are the leading cause of disability and represent a global public health problem, with most of these conditions appearing in early adulthood. Among the affected population, university students stand out, as they are at greater risk of experiencing stress, anxiety, and depression (3,4). In this regard, it has been shown that prolonged exposure to stress increases vulnerability to anxiety, depression, and other mood disorders (5).

In Colombia, multiple situations increase the risk of mental health disorders, particularly anxiety disorders. These include limited access to education, intense urban migration, lack of job training, crime and youth violence, substance abuse, and unplanned pregnancies. Data show that the Caribbean region of Colombia has the lowest prevalence of anxiety disorders, but its inhabitants are not exempt from the factors that can affect mental health (6).

In the university setting, it has been reported that academic pressure on health sciences students, including dentistry students, can trigger anxiety symptoms in this population, leading to a loss of control and the ability to cope with problems (7). Studies conducted in various institutions exploring the adverse effects of anxiety on students' academic performance found that those with high levels of anxiety performed worse academically than those with low anxiety (8), although these findings can be controversial (9).

Regarding depression, a prevalence of 3.8% has been reported in the general population, 5% in adults, and 5.7% in older adults (10). Depressive states are commonly associated with stress, understood as a set of neuroendocrine, immunological, emotional, and behavioral processes and responses to situations that demand a higher level of adaptation than usual and are perceived by the individual as threats or dangers to their biological or psychological integrity. Prolonged exposure to intense stressful events without the necessary or adequate coping resources leads to disproportionate feelings typically associated with depression (11).

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Moreover, throughout the academic journey in dentistry, students experience high levels of stress, involving emotional processes triggered by physiological changes that can have long-term consequences on their physical and mental health (12).

Among students in dentistry faculties and programs, several stressors have been identified, such as gender, relationships with peers, relationships with professors, exams and workload, lack of free time, and concerns about not meeting their parents' expectations (3,13). In addition, quality of life and financial situation are crucial factors that may contribute to academic stress. Variations in stress levels are linked to everyday life characteristics—for example, studies report that students who live with their parents or have strong family support networks tend to have lower stress levels than those who live in dormitories or share rooms with classmates (14).

Among dental students, it has been found that individuals with high levels of stress and a negative personal environment may develop depression, with suicide rates reported to be higher than those in other university programs (15). Depressed students are characterized by a lack of positive effect, feelings of hopelessness, and low self-esteem, while anxiety is marked by autonomic arousal and fear.

In a study conducted at a public university in Cartagena, Colombia, a prevalence of common mental disorders of 30.3% (95% CI: 27.3–33) was found among dental students. This group of disorders includes anxiety, depression, and somatoform disorders. This prevalence was considered high and was associated with factors such as gender, conflict, history of abuse or mistreatment, and risk situations (14).

In addition to the above, it has also been found that students have protective factors that help them better manage the demands and challenges of their academic journey. Cross-sectional studies have found an inverse relationship between well-being and depression, although this issue has been little explored in research on dental students (16). Therefore, this study proposes to analyze the behavior of this factor.

Knowing the global, national, and regional data that show dental students are prone to high levels of anxiety, stress, and depression, the following research question arises: What are the levels of anxiety, depression, and academic stress among students attending the Clinical Practice Center for Dentistry at Universidad del Sinú, and how are these levels related to quality of life and psychological well-being?

The importance of this study lies in four key aspects: first, to understand the levels of stress among dental students; second, whether the level of stress is related to anxiety and depression; third, the role of quality of life and well-being in mental health; and finally, to lay

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the groundwork for making decisions that contribute to improving students' emotional health.

MATERIALS AND METHODS

This was a cross-sectional study with a population consisting of dentistry students who were undertaking clinical practice at a private university on the Colombian Caribbean coast in 2024. For sample selection, cluster sampling was performed considering academic semesters VI to X, obtaining a sample of 59 study subjects who were randomly selected. The participants were Colombian students aged between 19 and 25 years, from socioeconomic strata 3, 4, and 5, without discrimination by gender or sex.

The following validated instruments with strong scientific evidence were implemented among the dentistry students at Universidad del Sinú, Montería, Colombia, to measure levels of academic stress and anxiety, depression, and quality of life.

The MOS SF-36 questionnaire was used to measure perceived quality of life, along with its manual and scoring system. The MOS SF-36 presents eight dimensions: Physical Functioning (PF): the extent to which health limits physical activities such as self-care, walking, climbing stairs, bending, lifting or carrying weights, and moderate to intense efforts. Role Physical (RP): the degree to which physical health interferes with work and other daily activities, including reduced performance, limitation in types of activities performed, or difficulty performing activities. Bodily Pain (BP): intensity of pain and its effect on usual work, both outside and inside the home. General Health (GH): personal health evaluation including current health, future health outlook, and resistance to illness. Vitality (VT): feelings of energy and vitality versus feelings of fatigue and exhaustion. Social Functioning (SF): degree to which physical or emotional health problems interfere with usual social activities. Role Emotional (RE): the extent to which emotional problems interfere with work or other daily activities, including reduced time spent on those activities, decreased performance, and less care in work. Mental Health (MH): general mental health, including depression, anxiety, behavioral and emotional control, and overall positive effects (17).

Additionally, the PSS-14 stress scale was used to evaluate the degree to which participants perceive situations in the past month as unpredictable and uncontrollable. It consists of 14 items with a 5-point Likert response format ranging from 0 (“never”) to 4 (“always”). To calculate the total PSS-14 score, the positive items (4, 5, 6, 7, 9, 10, and 13) are reverse-scored, and then all 14 items are summed. Scores range from 0 (minimum

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perceived stress) to 56 (maximum perceived stress), with three stress levels: low perception (0–18), moderate perception (19–37), and high perception (38–56) (18).

Another scale used was the Subjective Well-Being Scale (SWLS), which consists of five items that evaluate life satisfaction through the overall judgment people make about their lives. The items are as follows: (a) “In most ways, my life is close to my ideal,” (b) “I have gotten the important things I want in life,” (c) “I am satisfied with my life,” (d) “If I could live my life over, I would change almost nothing,” and (e) “The conditions of my life are excellent.” In this version, the response options were reduced from seven-to-seven points (originally seven), with values ranging from 1 (“strongly disagree”) to 7 (“strongly agree”). Total scores range from 5 (low satisfaction) to 35 (high satisfaction). Scores between 30–35 indicate high satisfaction, 25–29 satisfied, 20–24 slightly satisfied, 15–19 slightly below average life satisfaction, 10–14 dissatisfied, and 5–9 very dissatisfied (19).

Finally, the Hospital Anxiety and Depression Scale (HADS) was used, consisting of two subscales: Depression and Anxiety, each with seven items. Scores for each subscale range from 0 to 21, with each item having four response options from absence/minimal presence = 0 to maximum presence = 3. Higher scores indicate greater symptom severity. The time frame evaluated corresponds to the last seven days. The psychometric properties of HADS have been tested in Spanish-speaking patients with physical illnesses, demonstrating its usefulness for detecting psychological distress in this population. Cut-off points for anxiety and depression are 8 and 9, respectively (20,21).

All participants were read and explained the informed consent form, whose signature confirmed their voluntary agreement to participate. Participants’ identities were protected according to the guidelines established by Resolution 008430 of 1993 from the Ministry of Health and Social Protection of the Republic of Colombia. This research was considered low risk, as it was an observational study protecting individual privacy. Study results and findings were to be published for research purposes without violating patient-professional confidentiality or the anonymity of survey data. The study also adhered to Statutory Law 1581 of 2012 on the protection and treatment of personal data (Habeas Data), with an ethical commitment not to disclose identities. The research posed no risk to the population and complied with ethical standards in health research according to Colombian Ministry of Health regulations (Resolution 008430 of 1993, October 4) and international standards (Declaration of Helsinki) (22).

The following questionnaires were administered: MOS SF-36 for quality of life (17), PSS-14 stress scale (18), SWLS subjective well-being scale (19), and HADS for depression

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and anxiety (20). Data was recorded in an Excel sheet, and scores for the eight MOS SF-36 dimensions were calculated. The same was done for the other three questionnaires, calculating the meaning, median, and mode for all data obtained. Using R statistical software version 4.1.2, descriptive statistics were performed for categorical and nominal variables. Homoscedasticity was evaluated using Levene's test, and data homogeneity was assessed with the Kolmogorov-Smirnov test. The sample distribution did not meet normality assumptions, so Spearman's correlation for non-parametric data was performed.

RESULTS

SOCIODEMOGRAPHIC CHARACTERISTICS OF THE STUDENTS

The sample consisted of 59 dental students. Their ages ranged from a minimum of 19 to a maximum of 25 years, with the most frequent age range being 19 to 21 years (65%). Of the total, 56.7% were female and 84.9% came from rural areas.

Levels of stress, anxiety, depression, subjective well-being, and quality of life

The scores obtained from the instruments used to assess stress, anxiety, and depression among participants are presented in Table 1, showing measures of central tendency. Similarly, the results for levels of subjective well-being and quality of life are shown in Tables 2 and 3, respectively.

Table 1. Levels of stress, anxiety, and depression in study participants.

Measure	Mean	Mode	Median	Std. Dev.	Max	Min
Stress	25	26	25	5.1	38	14
Anxiety	12	15	15	4.5	20	2
Depression	10	2	11	5.8	20	0

Regarding stress, the mean score was 25, the mode was 26, and the median was 25. The highest score recorded was 38, and the lowest was 14.

According to the SSP-14 survey analysis, 10.66% of participants presented low stress levels (10.16%, n=6), 88.6% had moderate levels (n=52), and 1.69% (n=1) had high levels.

In the anxiety survey, the mean score was 12, with both mode and median both at 15. The maximum score was 20, and the minimum was 2. According to the cut-off point greater than 8, as established by Rico, Restrepo, and Molina in 2005 during the validation of the HAD questionnaire in Colombia (23), these scores are considered very high.

For depression, the mean score was 10, with a mode of 2 and a median of 11. The maximum score was 20, and the minimum was 0. These scores are also considered very high based on the cut-off point above 9 established by Rico, Restrepo, and Molina in the 2005 validation of the HAD questionnaire in Colombia (23).

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The HAD questionnaire revealed that 86.4% (n=51) of the surveyed students had anxiety, and 61.01% (n=36) had depression.

Table 2. Subjective well-being levels among study participants.

Measure	Mean	Mode	Median	Std. Dev.	Max	Min
Well-being	27	29	29	5.5	35	9

Regarding subjective well-being, the mean score was 27, with both the mode and median at 29. The maximum score was 35, and the minimum was 9.

The results suggest that most surveyed students had a positive perception of their well-being: 37% (n=22) reported being highly satisfied, 40% (n=24) satisfied, 12% (n=7) slightly dissatisfied, 7% (n=4) slightly below the average level of life satisfaction, 2% (n=1) dissatisfied, and 2% (n=1) very dissatisfied.

Table 3. Quality of life levels in study participants (MOS SF-36 instrument).

Dimension	Physical Function	Physical Role	Bodily Pain	General Health	Vitality	Emotional Role	Mental Health	Social Functioning
Mean	94	97	73	69	62	80	65	76
Mode	100	100	100	72	65	100	72	100
Median	100	100	72	72	65	100	64	75
Std. Dev.	10	8.1	24	15	14	31	15	20
Maximum	100	100	100	100	95	100	100	100
Minimum	55	75	0	20	30	0	32	25

The physical function domain showed a mean value of 94, with the mode, median, and maximum score all being 100, and a minimum score of 55.

In the physical role domain, the mean was 97, with the mode, median, and maximum again at 100, and a minimum of 75.

For bodily pain, the mean was 73, with a mode and maximum of 100, and a median of 72.

In general health, the mean was 69, mode and median were both 72, maximum was 100, and minimum was 20.

Vitality showed a mean of 62, with the mode and median at 65, maximum at 95, and minimum at 30.

In the emotional role domain, the mode was 80, and there was alignment between the mode, median, and maximum scores.

Regarding mental health, the mean was 65, the mode was 72, the median was 64, the maximum was 100, and the minimum was 32.

For social functioning, the mean was 76, mode and maximum were both 100, the median was 75, and the minimum was 25.

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All eight dimensions of the MOS SF-36 show high to very high levels, from very high (e.g., physical function) to moderately high (e.g., vitality and mental health), according to the Colombian validation by Lugo et al. (2006).

CORRELATION

The correlation results suggest a moderately high relationship between the variables of well-being/quality of life and anxiety/depression, indicating that as one variable increases, the other does so directly. The findings suggest that, although there are issues of stress, depression, and anxiety within the study population, these are mitigated by the students' good quality of life and well-being.

DISCUSSION

In the present study, it was found that the evaluated students exhibit excellent quality of life, as they are healthy individuals who do not report any diseases or constant episodes of pain. This may be explained by the fact that the studied age group consists of young adults with an average age of 22 years. Similarly, Díaz-Cárdenas et al. (2017) conducted a study estimating the association between health problems and health-related quality of life among dentistry students at a public Colombian university and found that 55.3% of participants perceived good health status and very good health-related quality of life, using the WHOQOL-BREF instrument (24). In contrast, Camargo et al. (2014), studying a similar population, reported that students did experience acute or chronic pain, which evidently affected their quality of life negatively (25).

Regarding the evaluated well-being, it was found that the students exhibit an optimal level of well-being. This suggests that the study population falls within normal parameters for their age and does not present health issues, consistent with the study by Vera Noriega et al. (2013) concerning standardized coefficients and the structure of psychological well-being components. The results indicated that the variables that most differed between students from Mexican and Brazilian universities were global life satisfaction and positive affect; again, negative affect was not a discriminating variable between the students from the two countries (26).

Similarly, this study’s findings on subjective well-being align with those reported by de Ureña Bonilla et al. (2015), who showed that 70% of university students had excellent subjective well-being. The present study evidenced that most students (77%) are satisfied with their lives, demonstrating excellent well-being in the population studied (27).

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On the other hand, the results revealed moderate stress levels among the students. Literature reports that stress can be associated with the high demands of the dentistry curriculum during the clinical practice phase. Alhajj et al. (2018), in a study including dentistry students from 13 developing countries, concluded that perceived stress was considerable across all countries, although the associated factors varied, highlighting workload and performance pressure as major contributors (13).

Our study found that 88.13% of students presented moderate stress levels, a very high value, which is confirmed by Córdova et al. (2018), who used the “Dental Environment Stress Questionnaire” in a sample of 140 Peruvian students, finding 75.7% with this condition. The situation that generated the most academic stress was the preclinical level and age (28). Likewise, Fonseca-Molina et al. (2018) reported moderate to severe stress levels across all courses in a dentistry program at a Chilean university, using the DES30-Sp questionnaire (29).

Machado et al. (2020) estimated anxiety prevalence among 141 Brazilian undergraduate dentistry students using the STAI-S instrument and found that 69.5% presented moderate to extreme anxiety at some point (30). In our study, 86.4% of participants exhibited anxiety at alarming levels, exceeding the general population average.

Similarly, depression prevalence in the student population of this study was 61.01%, considered high, contrasting with recent studies such as those by Raghunathan et al. (2019), who identified a 26.6% prevalence, and Stormon et al. (2019), who reported 24% prevalence in similar populations (dentistry students).

Basudan et al. (2017) concurrently evaluated stress, anxiety, and depression in university students, reporting severe and extremely severe scores for depression, anxiety, and stress in 20.2%, 34.0%, and 20.2% of students, respectively (31).

Damásio Moutinho et al. (2017) assessed prevalence of depression, anxiety, and stress using the DASS-21, finding 34.6% had depressive symptoms (8.8% severe or extremely severe), 37.2% had anxiety symptoms (12.2% severe or extremely severe), and 47.1% had stress symptoms (17.4% severe or extremely severe) (32). These results differ from ours, which showed 61% depression, 86.4% anxiety, and 88.3% stress, reflecting considerably higher values.

Romero Gonzales et al. (2016) observed that most students (80.7%) perceived their quality of life as low or poor (43.1% and 37.6%, respectively) (33). The dentistry students surveyed at Universidad del Sinú presented excellent quality of life, differing from Romero Gonzales’ participants who reported low and poor quality of life.

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The findings of this study encourage further understanding of the reality of dentistry students and their main barriers to mental health. Notably, despite perceiving good quality of life, high prevalences of stress, anxiety, and depression were observed. Based on these results, it is crucial to propose an intervention plan involving the Psychology Program to gradually reduce these psychological disorders and thus improve the quality of life of dentistry students.

CONCLUSION

Based on the results of this study, it can be concluded that this population of clinical dental students shows very high levels of stress, anxiety, and depression. Additionally, the scores for well-being and quality of life in the same group showed that participants have excellent well-being and a very good quality of life, which may help balance their overall health. Finally, it is suggested that this study be expanded to a larger sample size, and that an intervention plan be developed for students currently in the practical stage of the dental program.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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