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Prevalence of stress among dentistry students at a private university in Ecuador (Post COVID-19)

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Abstract

Dentistry stands out as one of the most challenging professions, as evidenced by research indicating that stress levels increase as academic complexity intensifies with advancing courses. The aim is to determine the prevalence of stress among students at the Faculty of Dentistry of the Catholic University of Cuenca, Azogues campus. The research was observational, descriptive, and cross-sectional, in which the Dental Environment Stress Questionnaire (DES30) was applied. The study population consisted of 403 students, and the final sample comprised 306 learners. The results highlight high levels of stress among dental students, such as fear of failing a course or a year (57.8%), lack of time for relaxation (38.6%), assessments and grades (38.9%), financial responsibilities (36.6%), patients arriving late or missing appointments (35.6%), and meeting graduation requirements (30.1%). It is concluded that the prevalence of stress varies among the various sources evaluated. Some sources, such as "fear of failing a course or a year," "assessments and grading," "number of homework assignments in class," "financial responsibilities," and "lack of time to complete assigned tasks," show notably high prevalence rates, between 89% and 96%.

Keywords: Prevalence, level, sources, stress, dental students

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1. Introduction

The World Health Organization (WHO) defines stress as the set of physiological responses that prepare the body for action, encompassing the psychological and physiological behavioral reactions of individuals who need to adapt to pressure-inducing situations, such as academic stress derived from interactions within the educational environment (Córdova-Sotomayor and Santa Maria, 2018). Professional training in the health field is especially stressful, as it can lead to psychological disorders associated with fatigue and, therefore, affect both professional and personal aspects of people's lives. Dentistry stands out as one of the most challenging professions, as evidenced by research indicating that stress levels increase as academic complexity intensifies with advancing courses (Brito-Ortíz et al., 2020; Moore et al., 2020; Rodríguez-Fernandez et al., 2020; Rodríguez et al., 2020).

Numerous studies have highlighted the notably high levels of stress perceived by health branch students. For the field of dentistry, Garbee in 1980 advocated for using the DESC questionnaire, also known as the "Dental Environment Stress Questionnaire," to measure the stress levels experienced by dental students (Lin et al., 2020; Mocny-Pachońska et al., 2020). It is evident that stress and anxiety levels significantly influence the academic performance of dental students due to a variety of elements, such as fears, external stressors, and biological responses to negative events, all of which have a direct impact on the emotional well-being of students during educational activities (Brito-Ortíz et al., 2020).

The lack of understanding of the prevalence and precise stressors affecting dental students is apparent. While stress is recognized as a common facet of the dental student experience due to the demanding nature of the field, comprehensive specific research on this population group at the institution in question has not yet been conducted. The absence of empirical data on the prevalence and triggering factors of stress hinders the institution's ability to implement effective preventive and supportive measures. Therefore, there is an urgent need to deepen and improve understanding of this issue to design interventions aimed at improving the well-being and academic performance of dental students at the Azogues campus of the Catholic University of Cuenca, which can serve as a reference for other institutions with similar characteristics. Therefore, the aim of the manuscript is to determine the prevalence of stress among students at the Faculty of Dentistry of the Catholic University of Cuenca, Azogues campus.

2. Materials and Methods

The research was observational, descriptive, and cross-sectional, in which the DES30 questionnaire was administered. The population consisted of students enrolled in the Dentistry program at the Catholic University of Cuenca, Azogues campus, Ecuador, who were in the academic cycle from October 2022 to March 2023. For the calculation of the sample size, Epidat 4.1 software was used. Considering the period from October 2022 to March 2023, the population was estimated to be 473 students, with a 95% confidence level, a precision of 3%, an expected proportion of 50%, and a design effect of 1.0. Stratified random sampling with proportional allocation was employed, with academic cycles as strata, achieving a sample size proportional to the population. The initial sample consisted of 328 students, but only 306 students decided to participate in the study by giving their informed consent. It is important to note that no descriptive data of the students or the evaluators responsible for administering the questionnaires were requested or provided to avoid convenience biases. Additionally, data were masked through single blinding so that the evaluators were unaware of the data of their evaluatees. Furthermore, the following inclusion criteria were defined for the study: 1. Students enrolled in the Dentistry program at the Catholic University of Cuenca, Azogues campus, who agreed to sign the informed consent form voluntarily and were over 18 years old. The exclusion criteria were as follows: 1. Students who did not cooperate or did not attend on the day the instrument was administered, and questionnaires that were not completed in full were discarded.

To obtain information and establish the level of stress perceived by dentistry students, the "Dental Environment Stress Questionnaire" created by Garbee (Kumar et al., 2009) and validated in Spanish by Rodríguez et al. (2020) with a Cronbach's Alpha of 0.957 was administered.

Prior to administering the instrument, the interviewer explained the study's objectives and the parameters of informed consent to clarify any doubts the participants might have. The time to complete the test was set at 20 minutes. Subsequently, each participant received the questionnaire, which contained 30 items distributed across 4 axes categorized according to the level of stress. A score of 1 represented "not stressful", 2 "slightly stressful", 3 "quite stressful", and 4 "very stressful", with a score of 1 indicating "absence of stress", 2 "low stress", 3 "moderate stress", and 4 "high stress". The questionnaire associated perceived sources of stress into 4 categories for evaluation:

- Clinical Training: including questions 4, 6, 9, 22, 30
- Time Constraints: including questions 12, 19, 23, and 26
- Beliefs of Self-Efficacy: including questions 10, 11, 17, and 29
- Academic Load: including questions 1, 2, 3, 5, 7, 8, 13, 15, 16, 20, 21 and 24

- Questions 14, 18, 25, and 27 are "Other sources" of stress triggers that help determine the level.

Regarding ethical considerations, the ethical principles established by the Declaration of Helsinki and other relevant ethical regulations will be followed. Students were asked to accept their participation in the study by signing an informed consent form. Additionally, they were informed that the confidentiality and privacy of their personal data would be protected. It is worth mentioning that the study has been approved by the Ethics Committee for Research on Human Beings of the Catholic University of Cuenca (CEISH-UCACUE), which is approved by the Ministry of Public Health (DIS-CEISH-UCACUE-01-017).

3. Resultados

Below, Table 1 shows the characteristics of the study subjects, with female students being the most represented in the dentistry program. It also presents the number of students in the dentistry program classified by each academic cycle.

Table 1. Characteristics of the study population.

Variable	Category	n	%
Sex	Female	208	67,97
	Male	98	32,03
Academic year	First	42	13,73
	Second	29	9,15
	Third	21	4,58
	Fourth	42	9,15
	Fifth	31	13,73
	Sixth	26	10,13
	Seventh	45	9,48
	Eighth	28	14,71
	Ninth	14	8,50
	Tenth	28	6,86

After analyzing the data illustrated in Table 2, there is a varied distribution of stress levels reported by dentistry students regarding different stressors. This diversity in students' stress perception indicates the presence of multiple factors influencing their academic and personal

encounters. For example, while some students may experience minimal stress levels regarding the volume of assigned tasks in class, others may face elevated stress levels due to task complexity. Therefore, it is essential to identify relevant stressors when analyzing the proportion of students reporting moderate or high stress levels in each evaluated aspect. These data allow us to prioritize interventions aimed at students' most pressing concerns. Among these notable sources of stress, with high levels of stress, are the fear of failing a course or a year (57.8%), lack of time for relaxation (38.6%), assessments and grades (38.9%), financial responsibilities (36.6%), patients arriving late or missing appointments (35.6%), and meeting graduation requirements (30.1%).

Table 2. Summary of levels for each source of Stressors

Code	Source of stress	Stress			
		Absence n (%)	Low n (%)	Moderate n (%)	High n (%)
F1	Number of homework assignments in class	16 (5.2)	155 (50.7)	87 (28.4)	48 (15.7)
F2	Difficulty of homework	32 (10.5)	159 (52)	71 (23.2)	44 (14.4)
F3	Competition with peers	108 (35.3)	95 (31)	54 (17.6)	49 (16)
F4	Patients arriving late or missing appointments	62 (20.3)	66 (21.6)	69 (22.5)	109 (35.6)
F5	Assessments and grading	15 (4.9)	76 (24.8)	96 (31.4)	119 (38.9)
F6	Environment created by clinical teachers	78 (25.5)	107 (35)	64 (20.9)	57 (18.6)
F7	Difficulty in learning the manual skills and accuracy required in pre-clinical and laboratory work	55 (18)	132 (43.1)	76 (24.8)	43 (14.1)
F8	Difficulty in learning clinical procedures and protocols	60 (19.6)	142 (46.4)	68 (22.2)	36 (11.8)
F9	Lack of adequate teaching staff in the clinics	99 (32.4)	105 (34.3)	45 (14.7)	57 (18.6)

F10	Lack of confidence to become a successful student	60 (19.6)	110 (35.9)	64 (20.9)	72 (23.5)
F11	Lack of internal confidence to become a successful dentist	68 (22.2)	114 (37.3)	59 (19.3)	65 (21.2)
F12	Lack of time to complete seminars, lab work or clinical requirements	33 (10.8)	103 (33.7)	87 (28.4)	83 (27.1)
F13	Career rules and regulations	52 (17)	134 (43.8)	61 (19.9)	59 (19.3)
F14	Lack of homelike atmosphere where you live	97 (31.7)	118 (38.6)	37 (12.1)	54 (17.6)
F15	Meeting degree requirements	44 (14.4)	90 (29.4)	80 (26.1)	92 (30.1)
F16	Lack of participation in the career decision-making process	62 (20.3)	126 (41.2)	59 (19.3)	59 (19.3)
F17	Insecurity about future career	48 (15.7)	111 (36.3)	62 (20.3)	85 (27.8)
F18	Financial responsibilities	25 (8.2)	98 (32)	71 (23.2)	112 (36.6)
F19	Lack of time to complete assigned tasks	29 (9.5)	103 (33.7)	92 (30.1)	82 (26.8)
F20	Inconsistency in feedback on their work among instructors	54 (17.6)	134 (43.8)	69 (22.5)	49 (16)
F21	attendance and success in medical subjects (e.g. internal medicine)	73 (23.9)	123 (40.2)	66 (21.6)	44 (14.4)
F22	Lack of communication or cooperation with patients	66 (21.6)	115 (37.6)	61 (19.9)	64 (20.9)
F23	Lack of time for relaxation	27 (8.8)	93 (30.4)	68 (22.2)	118 (38.6)
F24	fear of failing a course or a year	12 (3.9)	70 (22.9)	47 (15.4)	177 (57.8)
F25	Working while studying	103 (33.7)	86 (28.1)	51 (16.7)	66 (21.6)
F26	Neglect of personal life	48 (15.7)	110 (35.9)	68 (22.2)	80 (26.1)
F27	Fear of dealing with patients who do not declare the existence of a communicable disease	52 (17)	94 (30.7)	70 (22.9)	90 (29.4)
F28	Delay in obtaining books	77 (25.2)	121 (39.5)	63 (20.6)	45 (14.7)
F29	Lack of self-assessment and knowledge of one's own abilities	55 (18)	134 (43.8)	64 (20.9)	53 (17.3)
F30	Cooperation with the dental laboratory	65 (21.2)	116 (37.9)	59 (19.3)	66 (21.6)

In Table 3, each row indicates a specific source of stress, identified by a code and a concise description of that source. Regarding each stressor, the table includes the count of students indicating the absence of stress and those acknowledging the presence of stress. Additionally, the prevalence of stress is calculated and presented as a percentage, indicating the proportion of students reporting being stressed relative to the total number of surveyed students regarding that particular source.

The prevalence of stress varies among the different sources evaluated. Some sources, such as "fear of failing a course or a year" (F24), Assessments and grading (F5), Number of homework assignments in class (F1), Financial responsibilities (F18), and Lack of time to complete assigned tasks (F19), show notably high prevalence rates, ranging between 89% and 96%. Additionally, discrepancies in stress prevalence across various sources emerge. Some sources, such as "Working while studying" (F25) and "Attendance and success in medical subjects" (F21), exhibit reduced prevalence levels compared to others. This indicates that certain facets of students' academic and personal encounters may generate higher stress levels compared to others.

Table 3.Prevalence of stress in dental students according to the analysis of the source of stress.

Code	Source of Stress	Stress		
		Absence	Presence	Prevalence (%)
F1	Number of homework assignments in class	16	290	94.77
F2	Difficulty of homework	32	274	89.54
F3	Competition with peers	108	198	64.71
F4	Patients arriving late or missing appointments	62	244	79.74
F5	Assessments and grading	15	291	95.10
F6	Environment created by clinical teachers	78	228	74.51
F7	Difficulty in learning the manual skills and accuracy required in pre-clinical and laboratory work	55	251	82.03
F8	Difficulty in learning clinical procedures and protocols	60	246	80.39
F9	Lack of adequate teaching staff in the clinics	99	207	67.65

F10	Lack of confidence to become a successful student	60	246	80.39
F11	Lack of internal confidence to become a successful dentist	68	238	77.78
F12	Lack of time to complete seminars, lab work or clinical requirements	33	273	89.22
F13	Career rules and regulations	52	254	83.01
F14	Lack of homelike atmosphere where you live	97	209	68.30
F15	Meeting degree requirements	44	262	85.62
F16	Lack of participation in the career decision-making process	62	244	79.74
F17	Insecurity about future career	48	258	84.31
F18	Financial responsibilities	25	281	91.83
F19	Lack of time to complete assigned tasks	29	277	90.52
F20	Inconsistency in feedback on their work among instructors	54	252	82.35
F21	attendance and success in medical subjects (e.g. internal medicine)	73	233	76.14
F22	Lack of communication or cooperation with patients	66	240	78.43
F23	Lack of time for relaxation	27	279	91.18
F24	fear of failing a course or a year	12	294	96.08
F25	Working while studying	103	203	66.34
F26	Neglect of personal life	48	258	84.31
F27	Fear of dealing with patients who do not declare the existence of a communicable disease	52	254	83.01
F28	Delay in obtaining books	77	229	74.84
F29	Lack of self-assessment and knowledge of one's own abilities	55	251	82.03
F30	Cooperation with the dental laboratory	65	241	78.76

4. Discusión

The findings of this research reveal a significant prevalence of stress among dentistry students enrolled at the Universidad Católica de Cuenca. These results align with previous studies indicating that university students, particularly in challenging fields like dentistry, face

significant levels of stress (Brito-Ortíz et al., 2020; Moore et al., 2020; Rodríguez-Fernández et al., 2020; Rodríguez et al., 2020).

The presence of stress can lead to instability and emotional confusion. Assessing the scope of the impact caused by stress on dentistry students poses a challenge in terms of their daily functioning. This research identifies factors such as fear of failing a course, stress from exams and grades, lack of free time, and financial obligations as significant stressors. The intensity of stress levels may also be related to the nature of tasks and the level of execution thereof. Barraza-Macías and Barraza-Nevárez (2019) suggest that improving time management practices could help alleviate the effects of stress. However, this proposal does not meet students' requirements to effectively reduce the repercussions of stress progression and does not meet their main criteria.

Several stressors among students have been recognized, such as academic pressure, concern about professional progress, challenges in interpersonal connections, and financial commitments. These stress factors align with existing academic work on stress among university students, emphasizing academic demands and future uncertainties as significant contributors to stress (Stallman, 2010).

Estrada-Murillo and Evaristo-Chiyong (2018) highlight that higher education students exhibit the most severe stress manifestations, which could be related to the greater complexity of course content and a higher volume of clinical hours (Pomareda-Lagos and Garrido-Urrutia, 2023). Moya et al. (2023), based on their studies, propose a higher level of stress among third- and fourth-year dental education students, corroborating the opinion of Córdova-Sotomayor and Santa María (2018), who identify these academic years as a critical stage where preclinical dentistry students experience elevated stress levels. Additionally, Moore et al. (2020) observe a notable increase in stress levels as students progress in their dental education.

The findings underscore the need to implement interventions designed to alleviate stress and improve student well-being. These interventions may include stress management initiatives, counseling services, emotional support resources, and modifications to academic policies aimed at reducing academic and financial pressures (Hunt and Eisenberg, 2010).

5. Conclusions

After evaluating the collected data and subsequently calculating the prevalence of stress among students at the School of Dentistry at the Universidad Católica de Cuenca, Azogues campus, it is evident that stress constitutes a noteworthy issue within this student demographic group. The

findings demonstrate that a considerable majority of students report experiencing stress due to various sources, both in the academic and personal spheres. This underscores the importance of caring for the emotional well-being of students in the university setting.

The variability in the prevalence of stress among the different evaluated sources is apparent, with some sources showing higher prevalence compared to others. Factors such as time constraints for completing tasks, apprehensions regarding academic and professional achievements, and financial obligations consistently emerge as the main stress inducers among students. These results emphasize the need to implement supportive mechanisms and personalized resources to address these specific areas of concern.

Recognizing the urgency of addressing stress in the academic setting, it is imperative for the university and relevant stakeholders to acknowledge this issue and take proactive steps to foster a conducive learning environment that prioritizes students' holistic well-being. This may involve establishing stress management initiatives, promoting counseling and emotional support services, and adapting institutional policies and practices to alleviate academic and financial pressures.

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7. Conflict of Interest

The authors declare no conflicts of interest.

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