

Original Research Article

Perceived sources of stress and anxiety among Senegalese dental students

Papa A. Lecor^{1*}, Rokhaya Gadiaga¹, Seynabou Dieng¹, Sankoung Soumboundou²

¹Department of Physiology, ²Department Legal Odontology, Institute of Odontology and Stomatology, Cheikh Anta University, Dakar, Senegal

Received: 11 October 2023

Accepted: 13 November 2023

***Correspondence:**

Dr. Papa A. Lecor,

E-mail: papalecorchdent@yahoo.fr

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Dental studies are stressful and anxiety-provoking. The aim of this study was to assess the stress and anxiety levels of dental students at Cheikh Anta Diop university in Dakar, Senegal.

Methods: A descriptive cross-sectional study was conducted among 133 students. A general stress self-questionnaire (Perceived stress scale 14), another specific to dentistry studies and a final Spielberger anxiety questionnaire were distributed manually or electronically to students regularly enrolled in master's 1 and 2 at the institute of odontology and stomatology of Cheikh Anta Diop university in Dakar.

Results: A total of 121 students responded, giving a response rate of 90.97%. The average stress level was 20.8 ± 1.08 . Of these, 14 students (11.6%) had mild stress, 75.2% had moderate stress and 13.2% had high stress. The most commonly reported stress factors specific to dentistry studies were examinations and ongoing tests (67.7%), the pre-clinical transition to the clinic (70.3%), patient delays or missed appointments (83.5%), fear of making mistakes (67%, i.e., perforation, medical contraindications, etc.), the availability of equipment (70.3%), and conservative odontology and endodontics procedures (71.6%). Concerning anxiety, 113 students (93.4%) had a moderate level of anxiety and 2 students (1.6%) had a high level of anxiety.

Conclusions: This study showed that stress and anxiety are frequently found among dental students. Intervention strategies based on raising awareness and promoting psychological well-being in the educational context should be adopted for these students.

Keywords: Stress, Anxiety, Psychophysiological components, Students, Dentistry, Clinical procedures

INTRODUCTION

Students are increasingly becoming key objects of study in the social and health sciences. As students' progress through the stages of their education, they become more prone to depression and stress.¹ Stress is both a stimulus and a response that includes both physiological and psychological components that can affect normal functioning.² Medicine studies is perceived as a stressful time because it presents theoretical and clinical challenges for students. Factors such as the pace of study, exams, teaching requirements, socio-cultural pressure, competitiveness between students and changes in diet and

sleep patterns are serious determinants of mental health problems in students.³ Specifically, dental studies are still considered to be the most stressful.⁴ Senegalese masters students (clinical practice year) experience enormous stress for a variety of reasons, including hard-to-reach quotas, mastery of the theoretical undergraduate and clinical courses, managing anxious patients, limited free time, paying for patients' procedures, higher expectations and high expectations of academic performance. This stress is mainly due to the demanding nature of this formation.⁴ An increase in stress can lead to a decrease in student performance. According to North and Pfefferbaum, negative stress is an attrition generator,

increasing the vulnerability of individuals to suffer from anxiety disorders or depressive symptoms.¹ Conversely, positive stress enables students to cope with everyday events and is essential to life.⁴

Another psychosocial factor that affects students' mental health is anxiety. This manifests itself as an exaggerated fear reaction to events that are not always identifiable or that may be caused by inappropriate situations.⁶ Indeed, anxiety can be a major threat and have adverse effects on students' physical and/or mental health and well-being.^{7,8} An association has been found between higher levels of anxiety and mental health where anxiety levels have been the cause of significant problems such as burnout insomnia depression smoking alcohol.^{7,8} In addition, the depressive state is characterised by the contemplation of life as a failure and without meaning, and by experiences of irritability, tension and a lack of energy and sense of reality. The triggers of students' anxious responses are related to biological and cognitive triggers, respiratory response, the learning process and academic stress.⁹

In Senegal, it is difficult to find studies on the stress of dental students. In most surveys, dentistry is associated with medicine or health. Admittedly, they have many points in common, such as the timetable, a considerable workload, competition with students and the theoretical knowledge required. These health courses have a common first year with a highly selective competitive examination. In addition, published studies have focused more on the stress and anxiety associated with dental care, even though the students or practitioners who carry out this dental care are themselves sometimes more stressed or anxious than the patients.¹⁰⁻¹⁴ Hence the interest of this study, which focuses more specifically on master's students in dentistry. The aim of this study was to assess the stress and anxiety levels of dental students at Cheikh Anta Diop University in Dakar, Senegal.

METHODS

Study design

This was a descriptive cross-sectional study carried out in the form of a declarative survey using anonymous questionnaires. The institute of odontology and stomatology at Cheikh Anta Diop University in Dakar was the setting for the study. The study was conducted between February 2022 and July 2022. Participants were recruited between February 2022 and March 2022. The first distribution of the questionnaire took place between April and June 2022. The study ended on 10 July 2022.

Study population

The study was conducted among students regularly enrolled in master's 1 and 2 courses in dental studies. These were students in their clinical year who needed to acquire skills in working with patients. The cohort of students was selected from the lists of students regularly

enrolled in master's 1 and 2 in dental studies. The list was provided by the education department of the faculty of medicine, pharmacy and odonto-stomatology at Cheikh Anta Diop university in Dakar and contained the following information: first and last names and number of enrolments.

Inclusion criteria

This study included all students regularly enrolled in master's 1 and 2 in dental studies, who had given their informed consent to participate in the study.

Exclusion criteria

Students who refused to participate were not included in the study.

The study was approved by the ethics committee of the faculty of medicine, pharmacy and odonto-stomatology of Cheikh Anta Diop university in Dakar.

Sampling

The sample size was calculated using the Slovin formula. Slovin's formula is used to accurately determine the sample size. The Slovin formula is $n = \frac{N}{1 + Ne^2}$; n =sample size, N =Total population and e =error tolerance. The confidence level was 95% (giving a margin error of 0.05).

The calculated sample size was 133 students, i.e., all students enrolled in master's 1 and 2.

Questionnaires

Three questionnaires were drawn up according to the objectives of our survey, to obtain as much information as possible about dental studies from the students.

General stress questionnaire: perceived stress scale 14 (PSS-14)

The PSS-14 was used in this study. The PSS-14 was developed in 1983 by Cohen et al,¹⁵ initially validated in English, but numerous translations have also been validated. The full version of the Perceived Stress Scale (14 items) comprises two subscales: the negativity subscale (items 1, 2, 3, 8, 11, 12 and 14) and the positivity subscale (items 4, 5, 6, 7, 9, 10 and 13). Students are asked to rate the frequency of stressful situations they have experienced in the past month on a five-point scale from 0 (never) to 4 (very often). The total PSS-14 score is calculated by reversing the coding of positive items and adding up the scores for all items. Total scores range from 0 to 56. A higher score indicates a greater perception of stress. We used the following interpretation for the stress level: score between 0 and 13 corresponded to a low level of stress; score between 14

and 26 corresponded to a moderate level of stress; score between 27 and 56 corresponded to a high level of stress.

Dentistry stress questionnaire

A modified version of the Garbee et al questionnaire was created for stressors specific to dentistry learning (theoretical, preclinical, and clinical).¹⁶ Questions relating to the student's marital status, friendships and romantic relationships were not studied. Several items were added to improve the precision of the stress experienced during clinical procedures, as well as those that seemed relevant and specific to the institute of odontology and stomatology at Cheikh Anta Diop university in Dakar. Each item is measured using a 4-point Likert-type scale "not stressful, a little stressful, quite stressful, very stressful" instead of the 5 points used by Garbee et al in his 1980 questionnaire.¹⁶

This questionnaire had three parts: the first part concerned student satisfaction with their studies: Q1, Q2, Q3 and Q4, -the second part concerned theoretical learning data: Q5, Q6 and Q7, -the third part concerned clinical learning: Q8 to Q32.

Anxiety questionnaire: The Spielberger state-trait anxiety inventory (STAI)

The Spielberger STAI was used with the aim of obtaining a quantitative assessment of anxiety from students, according to precise recommendations.¹⁷ To be able to assess the level of anxiety we: count 1 point for the answer Almost never, 2 points for the answer Sometimes, 3 points for the answer Often and 4 points for the answer Almost always for questions 2, 4, 5, 8, 9, 11,12, 15, 17, 18 and 20. For questions 1, 3, 6, 7, 10, 13, 14, 16 and 19: the scoring is reversed: count 4 points for Almost never, 3 points for Sometimes, 2 points for Often and 1 point for Almost always. Then we add up the points.

For women, the average is 47.13. For men, the average is 39.27.

Above this average, the person is anxious. The higher the score, the greater the anxiety. In men, if the score is 51, the person is very anxious and this interferes with their quality of life. In women, if the score is 61, the person is very anxious and this interferes with their quality of life.

Validation of questionnaires or pre-test

The survey form was validated by an exhaustive survey of 4 master 1 students and 2 master 2 students. This pre-test enabled the questionnaires to be readjusted to ensure an adequate response from the students.

Distribution of questionnaires

The questionnaire was distributed manually. The first distribution of the questionnaire took place between April

and June 2022. The distribution options for this questionnaire were as follows: a single participation in the survey, impossibility of transferring the questionnaire to a student. The data confidentiality option was as anonymous as possible. Paper questionnaires were distributed at the end of lectures and at the beginning or end of clinical sessions in master's 1 and 2.

Each student received an anonymized questionnaire. An anonymity number was assigned to each questionnaire so that only one questionnaire per student was distributed, and to ensure data protection. A reminder of the electronic version of the questionnaire was sent online to all students who had not yet responded via the mailing lists. The paper version was deposited in a folder in the reception area of the institute of odontology and stomatology.

Statistical analysis

Statistical analysis was carried out using statistical package for social sciences (SPSS version 20) (IBM corporation, New York, USA). Descriptive statistics (means, standard deviations, percentages and frequencies) were calculated to assess the percentages and levels of stress and anxiety. The chi-square test was used to check whether there was an association between stress and anxiety and the different variables in the questionnaire. The significance level was set at $p \leq 0.05$.

RESULTS

A total of 121 students responded, representing a response rate of 90.97%. The average age of the students was 24.67 ± 1.86 years, with a minimum of 21 years and a maximum of 30 years. Our study population comprised 61 female students (50.4%) and 60 male students (49.6%) (Table 1). The mean stress score was 20.8 ± 1.08 . Ninety-one students had a moderate level of stress, i.e., 75.2% of students, and 13.2% had a high level of stress (Table 2). Regarding theoretical learning, exams and continuous assessments were considered quite stressful and very stressful for most students (67.7%) (Figure 1). They were significantly associated with stress ($p \leq 0.005$). Similarly, the preclinical to clinical transition was positively associated with a high level of stress ($p \leq 0.05$), for 36.4% of students (Figure 2). The results for other clinical aspects, including establishing a treatment plan, communicating with the patient and patient delays or missed appointments, are reported in Figure 2. Patient lateness or missed appointments were positively associated with a high level of stress ($p \leq 0.01$).

In terms of clinical procedures, conservative dentistry and endodontics ($p \leq 0.005$) were positively associated with a high level of stress, as were prosthodontics ($p \leq 0.01$) and paediatric dentistry ($p \leq 0.05$) (Figure 3). Potential pressure from teachers caused stress in 48.8% of students. Clinical procedures were performed on the patient from

the very first weeks, leading to a stress factor linked to the fear of making mistakes such as perforations or medical errors, and 31.5% of students were very stressed as a result (Table 3). The relationship between the number of procedures to be performed per semester and the time spent waiting for the teachers' opinion was positively associated with a high level of stress ($p \leq 0.01$) in 36.3% of students (Figure 4). Other aspects of clinical training were also studied, such as the working environment, hygiene, risks associated with patient contact, availability of equipment and ergonomics. Of all these factors, the availability of equipment and the risk of blood exposure accidents were the most stressful for students (Figure 5).

For women, average anxiety score was 56.17 ± 1.03 . For men, average was 44.22 ± 1.73 , also showed that 113 students had moderate level of anxiety (93.4%), and only 2 (1.6%) students had high level of anxiety (Table 4).

Table 1: Demographic data of dental students.

Variables	Dental students, n (%)
Age (mean \pm SD) (in years)	24.67 \pm 1.86
Gender, n (%)	
Women	61 (50.4)
Men	60 (49.6)
Level of education n (%)	
Master 1	65 (53.72)
Master 2	56 (46.28)
Total n (%)	121 (100)

Table 2: Perceived stress levels of dental students.

Stress levels	Dental student	
	N	%
Low stress	14	11.6
Moderate stress	91	75.2
High stress	16	13.2
Total	121	100

Table 3: Perceived stress levels of dental students according to fear of making mistakes.

Stress levels	Dental students	
	N	%
Not stressful	12	9.9
Little stressful	28	23.1
Quite stressful	43	35.5
Very stressful	38	31.5
Total	121	100

Table 4: Perceived anxiety levels of dental students.

Anxiety levels	Dental students	
	N	%
Low anxiety	6	5.0
Moderate anxiety	113	93.4
High anxiety	2	1.6
Total	121	100

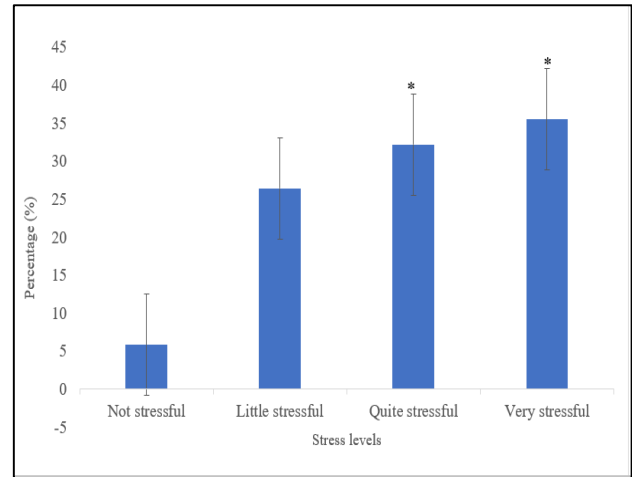


Figure 1: Perceived stress levels of dental students according to exams or continuous testing.

*Significant association $p \leq 0.0$.

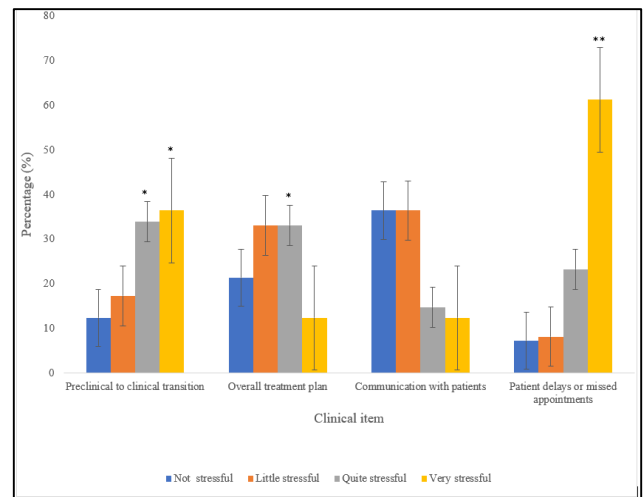


Figure 2: Perceived stress levels of dental students according to clinical item.

*Significant association $p \leq 0.05$, **Significant association $p \leq 0.005$.

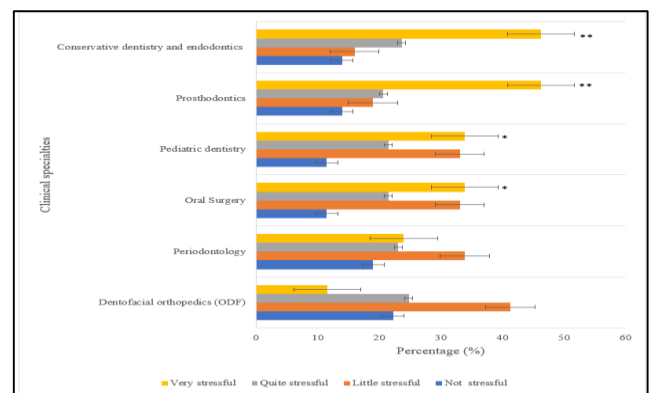


Figure 3: Perceived stress levels of dental students according to clinical speciality procedures.

*Significant association $p \leq 0.05$, **Significant association $p \leq 0.005$.

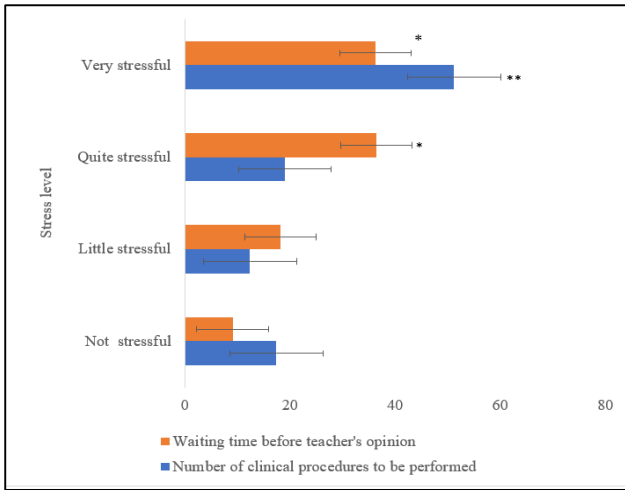


Figure 4: Perceived stress levels of dental students according to waiting time before teacher's opinion and number of clinical procedures to be performed.
 *Significant association $p \leq 0.05$, **Significant association $p \leq 0.005$.

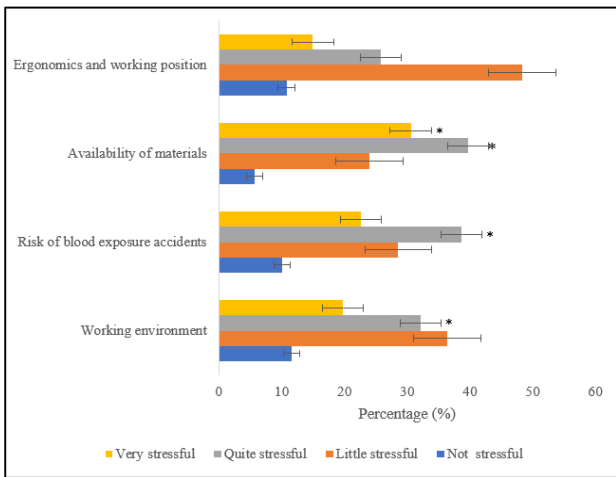


Figure 5: Perceived stress levels of dental students according to others clinical item.
 * Significant association $p \leq 0.05$.

DISCUSSION

Of the 133 students, 121 responded to the questionnaires, giving a response rate of 90.97%, which provides a representative overview of the population studied. None of the master's classes failed to complete the questionnaire, and the male/female breakdown is comparable to that of the original population. The high response rate despite the length of the questionnaire, which could have discouraged some students, means that the students found the study relevant. The issue of anonymity was of concern to some students, who feared that their anonymity would not be guaranteed. In fact, the study had to be uncompromising on the issue of anonymity, as required by scientific ethics, as the questions were very personal and allowed for a highly critical view of the training.

In terms of sources of stress for theoretical learning, exams ranked first among all sources of stress, with a significant link between the two. In the study by Garbee et al carried out forty years ago, exams were the second most important source of stress.¹⁷ It would therefore seem that exams remain one of the most stressful factors in dental studies over the years.

Our study confirms the international literature which considers that examinations and continuous assessment are major stress factors in dental studies.¹⁸⁻²¹ Over the last few decades, numerous studies around the world have examined the impact of stress during dental studies. The issue has been studied in dentistry schools in the United States, Europe, India, Saudi Arabia and Colombia, to name but a few.⁴

Beyond dental studies, students in other fields of study also experience exams as a major source of intense stress. The fact that exams are held at the end of the semester, thus adding to the number of subjects to be revised, is presumably one of the factors that overwhelms students. However, the LMD (License, master, doctorate or PhD) system has meant that exams have only been divided by semester for a few years now. Previously, exams were spread over the year. It would be better to introduce continuous assessment, with a multiplication of exams per subject, throughout the semester. As in other studies, students see this idea as a positive step towards better initial training.²²

This study also evaluated various aspects of clinical training: the transition to the clinic, contact with the patient, the various clinical procedures, the presence of teachers and the working environment. Of all the items, the fear of making mistakes (perforation, medical contraindications, etc.), the availability of equipment, and conservative odontology and endodontics procedures were the most frequently cited sources of stress.

A practical exercise, students were used to working on simulation models with resin teeth, but as soon as they enter the clinic, students gradually become aware of their responsibilities towards the patient they will be treating. Many students are stressed by this transition from the preclinical to the clinical setting. From now on, students will have to manage patients' pain, deal with patients and their requests, perform procedures on human beings, learn to perform procedures with the difficulties associated with working in the mouth (tongue, saliva), discover the financial aspect, etc. The fear of criticism from the teacher still exists, but this time with consequences for patients.

This fear of making mistakes also shows the student's lack of self-confidence, the desire to do well and the feeling of incompetence that the student may feel.

Pöhlmann et al. have shown that students who perform all dental procedures from their first years in hospital and

who have more contact with the patient have fewer doubts about considering themselves to be good future dentists.²³ As far as the availability of equipment is concerned, students often complain about the lack of clinical equipment and the fact that they have to go to another part of the department to hope to find it or manage on their own, with the result that they feel they are wasting their time and providing a poorer service to patients. Moreover, the national survey carried out by the association of Senegalese dental students in 2013 showed that 58% of students said they wanted to work but that the health center did not allow them to give their all for various reasons, including a lack of equipment. Several hypotheses can therefore be put forward concerning this lack of availability of equipment. It may be due to a reduced budget for purchasing and renewing equipment, or to a reduced number of staff to complete the sterilization cycle in the time available, which does not always allow for a good rotation of equipment. The third and most stressful aspect for the student is the number of procedures to be performed per semester, combined with the time spent waiting for the teacher's opinion. Time management is more stressful in the clinic than in practical work. The waiting time before the teacher's opinion is due to the lack of teachers in the face of the growing number of students. Polychronopoulou and Divaris even take the view that eliminating quotas of procedures to be performed could reduce student stress and improve their well-being.²⁰ The number of procedures to be performed was also significantly associated with the availability of equipment, stress linked to teachers' differing opinions and patients being late or missing appointments. In Senegal, dental students are not formally required to meet specific quotas. Assessment is based primarily on the variety of procedures to be performed, their quality and, finally, their number. Without this, some students would undoubtedly be tempted to work less, to perform only those procedures in which they feel comfortable, or which are the least arduous, and would distance themselves from the reality of the profession. The student must therefore learn to link procedures together and manage the notion of time. Patient delays and missed appointments are stressful for the students in this study. Students fall behind in their timetable and this slows down their learning. Patient delays and missed appointments remain stressful in private practice and are even the second most stressful factor for half of the dentists.⁴ With regard to clinical procedures, those performed in conservative dentistry and endodontics are the most stressful for more than half of the students. The stress experienced is therefore not related to the difficulty of the procedure itself, but rather to time management. Next come prosthodontics and paediatric dentistry procedures, reflecting the difficulty of these areas of dentistry.^{4,18,20}

The risks of blood exposure accidents and the risks associated with contagious patients are stressful for some students, but they are a risk and stress factor that dental

surgeons will encounter throughout their career. A systematic review published in 2011 had already determined that the main sources of stress for dental students were examinations, clinical requirements and dental supervisors.²⁴ This finding was reinforced by another systematic review and meta-analysis, published in 2014, which demonstrated that the stress felt by dental students is mainly due to the demanding nature of their learning.²⁵ The study also showed how stress during this period could have potentially negative effects on students' health and wellbeing, affecting their academic performance, psycho-emotional wellbeing and physical health.²⁵ Signs and symptoms of stress can include anxiety and depression, as well as somatic symptoms such as upset stomach and sweating.^{7,25-27} This study showed an high anxiety score (56.17 ± 1.03 for women and 44.22 ± 1.73 for men) and that 113 students had a moderate level of anxiety (93.4%) and 2 students had a high level. Anxiety can be a major threat and have adverse effects on students' physical and/or mental health and well-being. An association has been found between higher levels of anxiety and mental health where anxiety levels have been the cause of significant problems such as burnout, insomnia, depression, smoking and alcohol.^{7,23,26,27}

Limitations

The difficulty of distributing the paper version to all the students, for reasons of timetable, distribution in small groups of students on clinical rotations, and the non-attendance of students in class, was one of the limitations of the follow-up to our study. A reminder by e-mail did not significantly improve the response rate. Even though the questionnaire was fully automated, students did not respond by computer.

To improve the response rate, students should have been reminded more often of the return of the questionnaire and the importance of their participation, and there should have been more places for dropping off and returning questionnaires.

CONCLUSION

This study showed that psychosocial disorders (stress and anxiety) are frequently found among dental students at Cheikh Anta Diop university in Dakar. Intervention strategies based on raising awareness and promoting psychological well-being in the educational context should be adopted among students. The treatment of stress, anxiety and depression in students, through meditation or cognitive behavioural programmes, can have a positive impact on the mental health problems of students who are under pressure in their learning.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. North C, Pfefferbaum B. Mental health response to community disasters: A systematic review. *J Am Med Assoc.* 2013;310(5):507-18.
2. Hoareau V, Godin C, Dutheil F, Trousselard M. The Effect of Stress Management Programs on Physiological and Psychological Components of Stress: The Influence of Baseline Physiological State. *Appl Psychophysiol Biofeedback.* 2021;46(3):243-50.
3. Saxena S, Funk M, Chisholm D. World Health Assembly adopts Comprehensive Mental Health Action Plan 2013-2020. *Lancet.* 2013;381(9882):1970-1.
4. Elani HW, Allison PJ, Kumar RA, Mancini L, Lambrou A, Bedos C. A systematic review of stress in dental students. *J Dent Educ.* 2014;78(2):226-42.
5. Schönfeld P, Brailovskaia J, Bieda A, Zhang X, Margraf J. The effects of daily stress on positive and negative mental health: Mediation through self-efficacy. *Int J Clin Health Psychol.* 2016;16(1):1-10.
6. Quek TT, Tam WW, Tran BX, Zhang M, Zhang Z, Ho CS et al. The Global Prevalence of Anxiety Among Medical Students: A Meta-Analysis. *Int J Environ Res Public Heal.* 2019;16(15):2735.
7. Shamsuddin K, Fadzil F, Ismail WS, Shah SA, Omar K, Muhammad NA et al. Correlates of depression, anxiety and stress among Malaysian university students. *Asian J Psychiatr.* 2013;6(4):318-23.
8. Shin L, Liberzon I. The neurocircuitry of fear, stress, and anxiety disorders. *Neuropsychopharmacology.* 2010;35(1):169-91.
9. Barauskas I, Barauskienė K, Janužis G. Dental anxiety and self-perceived stress in Lithuanian University of Health sciences hospital patients. A cross-sectional study. *Stomatologija.* 2019;21(2):42-6.
10. Alsakr A, Gufran K, Alqahtani AS, Alkharaan H, Abushanan A, Alnufaiy B et al. Pre-Treatment and Post-Treatment Dental Anxiety in Patients Visiting Intern Dental Clinic. *Medicina (Kaunas).* 2023;59(7):1284.
11. Nermo H, Willumsen T, Johnsen JK. Prevalence of dental anxiety and associations with oral health, psychological distress, avoidance and anticipated pain in adolescence: a cross-sectional study based on the Tromsø study, Fit Futures. *Acta Odontol Scand.* 2019;77(2):126-34.
12. Egbor PE, Akpata O. An evaluation of the sociodemographic determinants of dental anxiety in patients scheduled for intra-alveolar extraction. *Libyan J Med.* 2014;9(1):25433.
13. Udoye CI, Oginni AO, Oginni FO. Dental anxiety among patients undergoing various dental treatments in a Nigerian teaching hospital. *J Contemp Dent Pract.* 2005;6(2):91-8.
14. Moore R, Birn H, Kirkegaard E, Brødsgaard I, Scheutz F. Prevalence and characteristics of dental anxiety in Danish adults. *Community Dent Oral Epidemiol.* 1993;21(5):292-6.
15. Cohen, S, Kamarck T, Mermelstein R. A global measure of perceived stress. *J Health Soc Behav.* 1983;24(4):385-96.
16. Garbee WH Jr, Zucker SB, Selby GR. Perceived sources of stress among dental students. *J Am Dent Assoc.* 1980;100(6):853-7.
17. Spielberger CD. Manual for the State-Trait Anxiety Inventory (STAI Form Y), Consulting Psychologists Palo Alto. Consulting Psychologists Press, Inc. 1983.
18. Fonseca J, Divaris K, Villalba S, Pizarro S, Fernandez M, Codjambassis A et al. Perceived sources of stress amongst Chilean and Argentinean dental students. *Eur J Dent Educ.* 2013;17(1):30-8.
19. Manolova MS, Stefanova VP, Panayotov IV, Romieu G, Belcheva AB, Markova KB et al. Perceived sources of stress in fifth year dental students--a comparative study. *Folia Med (Plovdiv).* 2012;54(2):52-9.
20. Polychronopoulou A, Divaris K. Dental students' perceived sources of stress: a multi-country study. *J Dent Educ.* 2009;73(5):631-9.
21. Muirhead V, Locker D. Canadian dental students' perceptions of stress. *J Can Dent Assoc.* 2007;73(4):323.
22. Divaris K, Barlow PJ, Chendea SA, Cheong WS, Dounis A, Dragan IF et al. The academic environment: the students' perspective. *Eur J Dent Educ.* 2008;12(1):120-30.
23. Pöhlmann K, Jonas I, Ruf S, Harzer W. Stress, burnout and health in the clinical period of dental education. *Eur J Dent Educ.* 2005;9(2):78-84.
24. Alzahem AM, Van der Molen HT, Alaujan AH, Schmidt HG, Zamakhshary MH. Stress amongst dental students: a systematic review. *Eur J Dent Educ.* 2011;15(1):8-18.
25. Alzahem AM, Van der Molen HT, Alaujan AH, De Boer BJ. Stress management in dental students: A systematic review. *Adv Med Educ Pract.* 2014;5:167-76.
26. George RP, Donald PM, Soe HHK, Tee SC, Toh J, Cheah MJQ. Prevalence of Symptoms of Depression, Anxiety, and Stress among Undergraduate Dental Students in Malaysia. *J Contemp Dent Pract.* 2022;23(5):532.
27. Basudan S, Binanzan N, Alhassan A. Depression, anxiety and stress in dental students. *Int J Med Educ.* 2017;8:179-86.

Cite this article as: Lecor PA, Gadiaga R, Dieng S, Soumboundou S. Perceived sources of stress and anxiety among Senegalese dental students. *Int J Res Med Sci* 2023;11:4294-300.