

# Profile of brazilian dental students and its relationship to anxiety levels

## Perfil dos alunos de odontologia e sua relação com os níveis de ansiedade

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### ABSTRACT

The aim of this study was to evaluate the profile of dental students and its relationship to anxiety levels. The State-Trait Anxiety Inventory was applied to 207 first- to fifth-year undergraduates enrolled in the dentistry program at the School of Pharmacy, Dentistry and Nursing, Federal University of Ceará, Brazil. Participants were aged 17 to 29 years, and the majority were women (57.5%). Students had a weekly workload of up to 40 hours and performed at least two complementary activities, in addition to their undergraduate training. Almost all students (95.7%) had attended private high schools and 80.6% lived with their parents or spouses. Regarding parental education, 59.4% of mothers and 55.6% of fathers had a higher education degree. Most students showed medium levels of anxiety according to measurements of state anxiety (53.1%) and trait anxiety (81.6%). It can be concluded that more than 50% of students in the Dentistry graduation course of the Federal University of Ceará showed an average level of anxiety, and that the excessive workload and enrichment activities necessary to obtain the undergraduate degree in Dentistry probably can be influencing the anxiety levels of students, however, more studies and statistical tests should be performed to identify the root causes in order to preserve the mental health of these future dentists.

**Keywords:** Dentistry. Dental students. Anxiety. Test anxiety scale.

### RESUMO

O objetivo deste estudo foi avaliar o perfil dos estudantes de odontologia e sua relação com os níveis de ansiedade. O Inventário de Ansiedade Traço-Estado foi aplicado a 207 alunos do primeiro ao quinto ano, matriculados no curso de Odontologia da Faculdade de Farmácia, Odontologia e Enfermagem da Universidade Federal do Ceará. Os participantes tinham entre 17 a 29 anos, e a maioria eram mulheres (57,5%). Os alunos tiveram uma carga de aulas semanais de até 40 horas e realizaram pelo menos duas atividades complementares, além do curso de graduação. Quase todos os alunos (95,7%) tinham frequentado escolas privadas e 80,6% viviam com seus pais ou cônjuges. Em relação à escolaridade dos pais, 59,4% das mães e 55,6% dos pais tinham um diploma de Ensino Superior. A maioria dos estudantes apresentaram níveis médios de ansiedade, ansiedade-estado (53,1%) e ansiedade-traço (81,6%). Pode-se concluir que mais de 50% dos alunos que frequentam o curso de Odontologia da Universidade Federal do Ceará demonstraram um nível médio de ansiedade, e que a carga horária excessiva e as atividades complementares necessárias para obtenção do título de graduação em Odontologia provavelmente podem estar influenciando os níveis de ansiedade dos alunos, entretanto, mais estudos e testes estatísticos devem ser realizados para identificar as principais causas, a fim de preservar a saúde mental desses futuros cirurgiões-dentistas.

**Palavras-chave:** Odontologia. Estudantes de odontologia. Ansiedade. Escala de ansiedade frente a teste.

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## INTRODUCTION

Anxiety can be defined as an emotional state that combines both physiological and psychological reactions. Anxiety is often triggered by feelings of fear in the face of imminent danger, which allows the affected person to take measures to deal with the threat, although the object that causes anxiety is not often identified. Anxiety, along with depression, has been regarded as one of the most common disorders affecting college students and may negatively affect their personal, social and professional lives.<sup>1,2,3</sup>

From the neurological point of view, anxiety can be classified as state- or trait-dependent. State anxiety is a transitory emotional state that consists of feelings of apprehension and tension experienced in a particular stressful situation. This state varies in intensity and fluctuates over time, being associated with heightened activity of the autonomic nervous system. Trait anxiety is an enduring personality trait (a stable characteristic), that is, an individual tendency to perceive stressful situations as dangerous or threatening, responding to such situations with an increase in anxiety intensity.<sup>2,3,4</sup>

The university environment is a major source of anxiety for many students in the health professions, such as dentistry, medicine and nursing. A wide variety of clinical and surgical practices, designed to develop psychomotor skills and involving technical complexities, have been shown to be closely related to high levels of anxiety among students, especially for students training to perform a new procedure.<sup>4</sup>

The early detection of anxiety in the college student population is therefore extremely important, because this disorder can heavily compromise the student's concentration and attention, health, academic performance, and the acquisition of new motor skills, negatively affecting the teaching-learning process.<sup>1,3,5</sup>

This study aimed to determine the demographic profile of dental students attending the School of Pharmacy, Dentistry and Nursing at the Federal University of Ceará, Brazil, and to establish a relationship with anxiety levels by assessing state and trait anxiety.

## MATERIALS AND METHODS

This was a longitudinal, observational study of first- to fifth-year undergraduate students enrolled in the dentistry program at the School of Pharmacy, Dentistry and Nursing, Federal University of Ceará, Brazil. Data collection was conducted between May and June 2010.

The required sample size was calculated using Epi-Info version 6.04, based on the following parameters: standard error less than 5.0%, 95% confidence interval (95%CI), and prevalence of 50% plus 20% related to sample loss,<sup>6</sup> which determined the sample size of 217 students, distributed across the semesters according to the percentage calculated from the total number of students per period/semester (six months). The distribution of students per period was as follows: 1st period – 25 students (11.54%); 2nd period – 23

students (10.70%); 3rd period – 21 students (9.85%); 4th period – 26 students (11.83%); 5th period and 6th period – 22 students (10.14%) each; 7th period – 16 students (7.32%); 8th period – 18 students (8.45%); 9th period – 25 students (11.26 %); and 10th period – 19 students (8.73%). Inclusion criteria were: being regularly enrolled in the dentistry program and following the curriculum implemented in 2005; having participated in at least 70% of the required activities in the semester. Each semester has a specific amount of credits – class hours – that must be fulfilled by the student, allowing its approval and progression in the graduation program. Each credit corresponds to 16 class hours. Distribution of credits by semesters: 1st semester - 28; 2nd semester - 30; 3rd semester - 28; 4th semester - 29; 5th semester - 30; 6th semester - 34; 7th semester - 28; 8th semester - 30; 9th semester - 33 and 10th semester - 30); and having not failed any discipline during the graduation course. The non-response rate was 4.6%, and the final sample consisted of 207 students.

The study was approved by the Research Ethics Committee of Federal University of Ceará (protocol no. 102/10), and written informed consent was obtained from all participants. The study was conducted in accordance with the provisions of the Declaration of Helsinki and resolution 196/96 of the Brazilian National Health Council, which regulates research involving human subjects.

### State-Trait Anxiety Inventory

The survey instrument was administered to the students during theoretical classes, with prior authorization of the subject professor. Initially, a questionnaire including questions about sociodemographic variables, such as housing, religion, income, and parental education, among others, was administered. Then, a validated Portuguese version of the State-Trait Anxiety Inventory (STAI) was used to assess students' levels of anxiety.<sup>7</sup> The STAI is a self-administered test, applied individually or in groups, composed of two different 4-point Likert-type scales designed to measure state anxiety (part I) and trait anxiety (part II). Each scale consists of 20 statements, for which the respondent gives an answer ranging from 1 to 4, which results in a final score ranging from 20 to 80, with higher scores correlating with greater anxiety. For data analysis, anxiety levels were divided as follows: 20 to 40 points = low level of anxiety; 41 to 60 points = medium level of anxiety; and 61 to 80 points = high level of anxiety.

### Statistical analysis

Data obtained were analyzed with descriptive statistics and the chi-square test. The results were expressed as absolute values, univariate and bivariate score distributions (%), and statistical measurements (minimum, maximum, mean, median, standard deviation, and coefficient of variation). Anxiety levels were determined from the arithmetic mean corresponding to each STAI statement, and the results were classified as follows: 1 to 3 – low level, 4 to 7 – medium

level, and 8 to 10 – high level.<sup>8,9</sup> Statistical analysis was performed using the Statistical Package for the Social Sciences version 17.0 (SPSS Inc., Chicago, IL, USA). The level of significance was set at 5%.

## RESULTS

The 207 students who participated in the study were evenly distributed across the semesters, with 69 (33.3%) students enrolled in the initial period of the program (1st to 3rd semesters), 76 (36.7%) in the middle of the program (4th to 7th semesters), and 62 (30.0%) in the final period (8th to 10th semesters).

According to sociodemographic and economic characteristics, most students were women, aged 21 to 24 years, mostly unmarried and Catholic. Almost all students had attended private high schools, lived with their parents or spouses, did not work and had their expenses paid by the family (Table 1).

Regarding parental education, 59.4% (n = 123) of mothers and 55.6% (n = 115) of fathers had a higher education degree. The mothers worked mainly in the following areas: pedagogy (n = 32, 15.5%), arts (n = 10, 4.8%), dentistry (n = 4, 1.9%), and business administration (n = 4, 1.9%); whereas the fathers worked mainly in law (n = 14, 6.8%), business (n = 13, 6.3%), civil engineering (n = 9, 4.3%), medicine (n = 6, 2.9%), and dentistry (n = 2, 1.0%).

When analyzing academic variables, over half of the students succeeded in their first attempt to enter the dentistry program, while the others made two or more attempts (in Brazil, students must pass an entrance examination to attend college). The weekly working hours, corresponding to theoretical and practical lessons, ranged from 30 to 40 hours per week and most students performed research, extension

and monitoring activities, alone or combined, but only a few participated in activities in a shift system (Table 2).

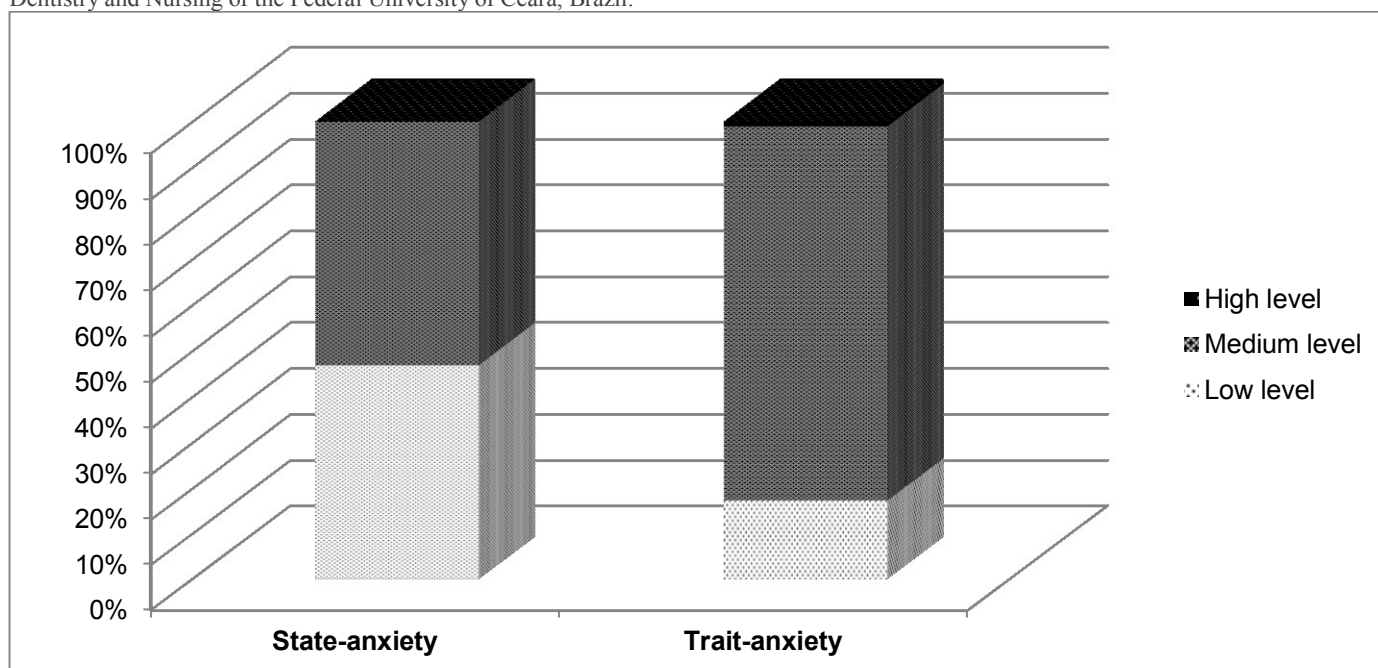
The values for state anxiety (part I) were higher than those obtained for trait anxiety (part II); however, mean values for both state and trait anxiety showed that students had medium levels of anxiety (Table 3).

With respect to the measurement of state anxiety (part I) by the STAI, just over half of the students showed medium levels of anxiety (n = 110, 53.1%), while the others had low levels of anxiety (n = 97, 46.9%). Regarding trait anxiety (part II), most students had medium levels of anxiety (n = 169, 81.6%), 36 students (17.4%) had low levels of anxiety, and only two students (1.0%) showed high levels of anxiety (Figure 1).

The results for anxiety levels (parts I and II) were also analyzed separately according to sex. The analysis of state anxiety (part I) revealed that most women had low levels of anxiety, while most men showed medium levels of anxiety. Regarding trait anxiety (part II), both women and men showed medium levels of anxiety (Table 4).

The two-tailed chi-square test revealed a strong association of STAI scores with weekly workload (p1) and academic activities (p2) undertaken by students, particularly extracurricular research, monitoring, and extension activities (activities outside the university environment through actions with the urban and rural communities in the form of programs, projects, courses, events and services) and training courses (courses directed to dental care and can be performed in hospitals or emergency dental services under the regime of duty) (p<0.000) (Table 5).

**Figure 1** - Distribution of state-anxiety and trait-anxiety levels of students enrolled in the dentistry program at the School of Pharmacy, Dentistry and Nursing of the Federal University of Ceará, Brazil.



**Table 1** - Distribution of students enrolled in the dentistry program at the School of Pharmacy, Dentistry and Nursing of the Federal University of Ceará, Brazil, according to sociodemographic and economic variables.

Variables	N	%	Accumulated %
<b>Sex</b>			
Male	84	40.6	40.6
Female	119	57.5	98.1
Not reported	4	1.9	100.0
<b>Age group</b>			
17 to 20 years	78	37.7	37.9
21 to 24 years	111	53.6	91.7
More than 25 years	17	8.2	100.0
Not reported	1	0.5	-
<b>Marital status</b>			
Single	200	96.6	96.6
Married	4	1.9	98.6
Separated/divorced	1	0.5	99.0
Not reported	2	1.0	100.0
<b>Religious belief</b>			
Catholic	158	76.3	76.3
Evangelical	22	10.7	86.0
Agnostic/atheist	11	5.3	92.3
Other	13	6.3	98.6
Not reported	3	1.4	100.0
<b>Housing</b>			
With parents	163	78.7	78.7
Alone	11	5.3	84.1
With other relatives/spouse	26	12.5	96.6
Other	6	2.9	99.5
Not reported	1	0.5	100.0
<b>Income</b>			
Does not work	188	90.8	90.8
Works and receives financial support from the family	17	8.2	99.0
Works and provides financial support for the family	1	0.5	99.5
Not reported	1	0,5	100,0
<b>Completion of high school</b>			
Public school	7	3.4	3.4
Private school	198	95.7	99.0
Not reported	2	1.0	100.0
Total	207	100.0	-

**Table 2** - Distribution of students enrolled in the dentistry program at the School of Pharmacy, Dentistry and Nursing of the Federal University of Ceará, Brazil, according to academic variables.

Variables	N	%	Accumulated %
<b>Attempts to enter the dentistry program*</b>			
One	117	56.5	56.5
Two	58	28.0	84.5
Three	20	9.7	94.2
Four or more	9	4.4	98.6
Not reported	3	1.4	100.0
<b>Weekly workload</b>			
Up to 20 hours	6	2.9	2.0
20 to 30 hours	74	35.7	38.6
30 to 40 hours	108	52.2	90.8
More than 40 hours	15	7.2	98.1
Not reported	4	1.9	100.0
<b>Participation in other academic activities</b>			
Monitoring	7	3.4	3.9
Research	11	5.3	8.7
Extension	54	26.2	34.8
Not participating	38	18.4	53.1
Other	3	1.4	54.6
Research + monitoring	10	4.8	64.7
Monitoring + extension	22	10.6	75.4
Research + extension	22	10.6	82.6
Other + monitoring	2	1.0	83.6
More than two activities	33	15.9	99.5
Not reported	1	.5	100.0
<b>Activities in a shift system</b>			
Yes	18	8.7	8.7
No	187	90.3	99.0
Not reported	2	1.0	100.0
Total	207	100.0	-

\* In Brazil, students must pass an entrance examination to attend college.

**Table 3** - State-anxiety (part I) and trait-anxiety (part II) values for students enrolled in the dentistry program at the School of Pharmacy, Dentistry and Nursing of the Federal University of Ceará, Brazil.

	Minimum	Maximum	SD	Mean	Median
Part I	28	59	0.435	41.34	41.00
Part II	34	62	0.434	45.30	45.00

SD = standard deviation.

**Table 4** - Distribution of state-anxiety (part I) and trait-anxiety (part II) levels according to sex among students enrolled in the dentistry program at the School of Pharmacy, Dentistry and Nursing of the Federal University of Ceará, Brazil.

	Part I		Part II	
	N	%	N	%
<b>Male</b>				
Low level	29	34.5	15	17.9
Medium level	55	65.5	68	81.0
High level	0	0	1	1.2
<b>Female</b>				
Low level	65	54.6	19	16.0
Medium level	54	45.4	99	83.2
High level	0	0	1	0.8
<b>Not reported</b>				
Low level	3	75.0	2	50.0
Medium level	1	25.0	2	50.0
Total	207	100	207	100

**Table 5** - Association of State-Trait Anxiety Inventory (STAI) scores with weekly workload (p1) and academic activities (p2) undertaken by students enrolled in the dentistry program at the School of Pharmacy, Dentistry and Nursing of the Federal University of Ceará, Brazil.

	STAI	Yes	No	UD	Value of p1	Value of p2
Stai-State	I feel comfortable	27	24	03	0.000	0.000
	I feel upset	120	118	02	0.000	0.000
	I am a nervous wreck	119	118	01	0.000	0.000
	I am satisfied	35	33	02	0.000	0.000
	I feel cheerful	22	21	01	0.000	0.000
	I feel good	17	16	01	0.000	0.000
Stai-trait	I feel good	06	04	02	0.000	0.000
	I get tired easily	30	29	01	0.000	0.000
	I would like to be happy	105	103	02	0.000	0.000
	I am happy	206	00	01	0.000	0.000
	I worry about the disappointments	206	00	01	0.000	0.000
	I am a steady person	205	00	02	0.000	0.000
	I get tense and upset	206	00	01	0.000	0.000

## DISCUSSION

The profile of dental students in some colleges and universities across the country and the world is very similar to that found in the dentistry program at the School of Pharmacy, Dentistry and Nursing of the Federal University of Ceará, Brazil. There is a growing increase in the number of women enrolled in dentistry programs, which indicates a feminization of the profession.<sup>10-12</sup> Also noteworthy is the fact that this population is predominantly composed of young students, aged 17 to 24 years, unmarried and not employed, living with parents or relatives.<sup>13-15</sup>

The socioeconomic characteristics, including family income and parental education, appear to have strong influence on

students' access to higher education. Parents with a higher education degree appear to assume greater responsibility in transmitting cultural and work-related values to their children.<sup>16,17</sup> Although there is no actual evidence that children of parents with a college degree will succeed in their first attempt to enter college, we must consider that there is a strong influence of parents with higher education on the professional success of their children, including their entry into college or university.<sup>16,17</sup> This information corroborates the results of this study, in which most parents had a higher education degree and most students succeeded in their first attempt to enter the dentistry program.

Anxiety can be classified into physiological and pathological categories. Physiological anxiety is considered "normal" and



part of a spectrum of daily experiences. This type of anxiety is inherent in the human race and deemed necessary as long as it works to motivate and awaken the body, putting it on guard against a threatening situation that can affect emotional stability.<sup>6</sup> Pathological anxiety, also known as anxiety disorder, is characterized by a disproportionate response to the situation that triggers it. This type of reaction is directly related to an exacerbation of physiological symptoms, such as tachycardia, muscle aches, insomnia, poor appetite, dizziness, vomiting, and excessive tiredness, as well as of psychological symptoms, such as feelings of fear and/or insecurity, anxiety, irritability, worry, and apprehensive anticipation.<sup>18,19</sup> Both types of anxiety can be measured by clinical self-assessment rating scales; STAI being one of the most commonly used scales to assess subjective anxiety-related components.<sup>20</sup>

Students in the health professions, especially those enrolled in dentistry, medicine and nursing programs, usually have very high levels of anxiety compared to students from other courses, such as those in the humanities and technology.<sup>3</sup> The main reasons for the prevalence of anxiety symptoms in these students include the complexity of the techniques practiced in the operating room, the need for psychomotor skills, extensive curriculum, in addition to internships, extracurricular activities (research, monitoring, extension and internships activities, participation in scientific events in dentistry performed during the free hours of theoretical and practical classes during the course) and shift working hours that must be completed by the end of the course.<sup>21-23</sup>

When analyzed by sex, in our study both state- and trait-anxiety levels were higher for men than for women, but with no significant differences between sexes, although some studies have shown that women have higher levels of anxiety than men during university life.<sup>5,23</sup>

In order to obtain a degree in dentistry, students are required to meet a high weekly workload and engage in a large number of extracurricular activities and training courses, which may negatively affect their academic performance and physical and mental health, triggering symptoms of

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depression and anxiety (24,25). This study found a positive association between anxiety levels and the amount of study hours and extra lessons undertaken by students per week ( $p<0.000$ ) and extracurricular activities performed within the university environment ( $p<0.000$ ) (Table 5).

Recent studies have found no significant differences in anxiety levels of medical students compared to students from other courses.<sup>22</sup> Therefore, high levels of anxiety may be associated with the period of university life rather than the course itself. However, other studies suggest that obsession and perfectionism are common traits among students in the health professions, which may explain the frequent reports of anxiety, stress, depression, drug abuse and suicides among students and health professionals.<sup>23-25</sup>

In summary, most dental students investigated in this study were young single women, who had attended private high schools, lived with their parents, did not work and had their expenses paid by their families. These students, however, were engaged for 30 to 40 hours per week in activities required to meet curriculum demands of the dentistry program, in addition to performing extracurricular activities, which may have caused anxiety among the students.

## CONCLUSION

From the main results, we can conclude that a significant proportion (over 50%) of students in the Dentistry course of the Federal University of Ceará showed a medium level of anxiety, and possibly that the excessive workload and activities further necessary for obtaining the undergraduate degree may be influencing the anxiety levels of students. More studies and statistical tests should be performed to identify the main causes of high anxiety of students in order to preserve mental health and improve the quality of life of future dentists.

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