Vulnerability to Stress and Self-Perception of Bruxism among Undergraduate Students of a Health School *

Vulnerabilidad al estrés y autopercepción del bruxismo en estudiantes de pregrado de una facultad de salud

Vulnerabilidade ao estresse e autopercepção do bruxismo em estudantes de graduação de uma escola da área da saúde

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ABSTRACT

Background: Students of health disciplines are vulnerable to stress. This can negatively affect their physical well-being and increase the likelihood of disorders such as bruxism. **Purpose**: To determine the relationship between vulnerability to stress and self-perception of bruxism in undergraduate students of physiotherapy, occupational therapy, and dentistry, as well as to analyze possible

differences between academic programs. **Methods**: A cross-sectional, descriptive, observational study was conducted in 2023 in 168 undergraduate students enrolled in the physiotherapy, occupational therapy, and dentistry programs at the Universidad del Valle, San Fernando campus, Cali, department of Valle del Cauca, Colombia. The variables were vulnerability to stress and self-perception of bruxism. **Results**: More than 52 % of students experienced high levels of stress and more than 60 % reported suffering from bruxism with symptoms such as headaches. Associations were identified between bruxism and variables such as gender, academic program, socioeconomic level, employment, and stress. Males were 48 % less likely to have bruxism than females. Occupational therapy showed a higher likelihood of bruxism and higher degrees of stress were related to a higher likelihood of bruxism. This study highlights the importance of addressing stress and bruxism in health students. **Conclusion**: Health students show different degrees of vulnerability to stress that are related to a higher risk of bruxism, especially in females. This underlines the need to address stress and bruxism in this student group, considering social factors.
Keywords: bruxism; Cali, Colombia; dentistry; education; health disciplines; mental health; occupational therapy; physical therapy; stress; student; vulnerability to stress

RESUMEN

Antecedentes: Los estudiantes de disciplinas de la salud son vulnerables al estrés. Esto puede afectar negativamente su bienestar físico y aumentar la probabilidad de trastornos como el bruxismo. **Objetivo:** Determinar la relación entre la vulnerabilidad al estrés y la autopercepción del bruxismo en estudiantes de pregrado de fisioterapia, terapia ocupacional y odontología y analizar posibles diferencias entre estos programas académicos. **Métodos:** Se realizó en 2023 un estudio observacional de diseño descriptivo transversal en 168 estudiantes de pregrado matriculados en los programas de fisioterapia, terapia ocupacional y odontología de la Universidad del Valle, sede San Fernando, Cali, departamento del Valle del Cauca, Colombia. Las variables fueron vulnerabilidad al estrés y autopercepción del bruxismo. **Resultados:** Más del 52 % de los estudiantes experimentó niveles elevados de estrés y más del 60 % reportó padecer bruxismo con síntomas como dolores de cabeza. Se identificaron asociaciones entre el bruxismo y variables como género, programa académico, nivel socioeconómico, empleo y estrés. Los hombres mostraron un 48 % menos de probabilidad de tener bruxismo que las mujeres. Terapia ocupacional mostró mayor probabilidad de bruxismo y grados más altos de estrés relacionados con mayor probabilidad de padecerlo. Este estudio subraya la importancia de abordar el estrés y el bruxismo en estudiantes de salud. **Conclusión:** Los estudiantes de salud muestran diferentes grados de vulnerabilidad al estrés que se relacionan con un mayor riesgo de bruxismo, especialmente en mujeres. Esto acentúa la necesidad de abordar el estrés y el bruxismo en este grupo estudiantil, considerando factores sociales.
Palabras clave: bruxismo; Cali, Colombia; disciplinas de la salud; educación; estrés; estudiante; fisioterapia; odontología; salud mental; terapia ocupacional; vulnerabilidad al estrés

RESUMO

Antecedentes: Estudantes de disciplinas de saúde são vulneráveis ao estresse. Isso pode afetar negativamente o seu bem-estar físico e aumentar a probabilidade de distúrbios como o bruxismo. **Objetivo**: Determinar a relação entre vulnerabilidade ao estresse e autopercepção do bruxismo em estudantes de graduação em fisioterapia, terapia ocupacional e odontologia e analisar possíveis diferenças entre esses cursos acadêmicos. **Métodos**: Um estudo observacional com desenho descritivo transversal foi realizado em 2023 com 168 estudantes de graduação matriculados nos programas de fisioterapia, terapia ocupacional e odontologia da Universidad del Valle, campus San Fernando, Cali, Valle del Cauca, Colômbia. As variáveis foram vulnerabilidade ao estresse e autopercepção do bruxismo. **Resultados**: Mais de 52% dos estudantes vivenciaram altos níveis de estresse e mais de 60% relataram sofrer de bruxismo com sintomas como dores de cabeça. Foram identificadas associações entre bruxismo e variáveis como gênero, programa acadêmico, nível socioeconômico, emprego e estresse. Os homens tinham 48% menos probabilidade de ter bruxismo do que as mulheres. A terapia ocupacional apresentou maior probabilidade de bruxismo e maiores graus de estresse relacionados a maior probabilidade de sofrê-lo. Este estudo destaca a importância de abordar o estresse e o bruxismo em estudantes da área da saúde. **Conclusão**: Os estudantes da área da saúde apresentam diferentes graus de vulnerabilidade ao estresse que estão relacionados a um maior risco de bruxismo, principalmente em mulheres. Isso acentua a necessidade de abordar o estresse e o bruxismo nesse grupo de estudantes, considerando os fatores sociais.
Palavras-chave: bruxismo; Cali, Colômbia; disciplinas da saúde; educação; estresse; estudante; fisioterapia; odontologia; saúde mental; terapia ocupacional; vulnerabilidade ao estresse

INTRODUCTION

Stress affects a growing number of people at different stages of life, regardless of gender, age, or socioeconomic status. It is defined as a mental state of tension or worry triggered by challenging situations

(1). Stress may also have multifactorial causes, including physiological, psychological, or cognitive deterioration under threatening conditions, impacting the well-being of those who experience it. Furthermore, stress manifests through alterations, irregularities, or pathologies that limit physical and mental development and functioning (2). This phenomenon is known as stress vulnerability, which is associated with the perception of demands and obstacles faced in relation to confidence in one's abilities and resources to overcome them (3,4).

Bruxism is a parafunctional activity that includes dysfunctional oral and motor behaviors, manifested as clenching or inappropriate grinding of the teeth. It is sometimes accompanied by grinding sounds, increasing the load on the oral structure. This clenching is considered pathological when it causes pain, dental problems, aesthetic changes, and musculoskeletal dysfunction, affecting quality of life (5,6). However, despite its high prevalence, as a multifactorial parafunction, the available studies are insufficient to establish a comprehensive diagnosis (7-9).

In this context, some studies show that university students are particularly susceptible to stress, which affects their physical and mental health (10-12). This state increases the risk of developing disorders such as bruxism, since the impact on the emotional centers of the brain, such as the hypothalamus, the reticular system and the limbic system, produces an increase in muscle tone, which can lead to this parafunction (9).

According to recent epidemiological data, stress levels among university students have shown a significant increase, with prevalence rates ranging from 50 % to 80 %. These findings come from studies conducted at the Pontificia Universidad Católica de Argentina (2019) and the Universidad Cooperativa de Colombia (2021) (13,14). This phenomenon particularly affects students in health-related disciplines due to factors such as the density of theoretical course content, responsibility for patient care, and the high academic demands they face. Health programs, such as dentistry, physiotherapy, and occupational therapy, typically last 4 to 5 years in Latin America.

In addition to the characteristics of the academic environment, which can be considered as stressors, students often face additional situations that increase their vulnerability to stress, such as family, personal, socioeconomic, or contextual problems. These conditions affect both their emotional and physical dimensions, altering their response capacity. Therefore, it is crucial to analyze the degree of vulnerability to stress in which students in these training areas are found (15).

It is essential to consider that stress is a public health issue that must be analyzed and addressed within the academic environment. This underscores the need to design effective future strategies for its prevention and management, such as counseling, psychological support, guidance, and mentoring. These actions could reduce the risks associated with the development of chronic diseases and temporomandibular disorders, which impact both the quality of life and well-being of students and future healthcare professionals.

Furthermore, addressing these processes is essential because it allows future professionals to develop the necessary tools to face the dynamics and demands of the working world, promoting better professional performance and greater resilience in the face of stressful situations. Therefore, this research aimed to determine the relationship between vulnerability to stress and self-perception of bruxism in undergraduate students of physiotherapy, occupational therapy and dentistry and to analyze possible differences between these academic programs at the Universidad del Valle, in Cali, Colombia.

MATERIALS AND METHODS

An observational cross-sectional descriptive study was conducted using a survey as the primary tool. The target population included all students enrolled in 2023 in the physiotherapy, occupational therapy, and dentistry programs at Universidad del Valle, San Fernando campus, Cali, Valle del Cauca, Colombia. The sample consisted of students who agreed to participate in the study by signing an

informed consent form and who met the inclusion criteria: being enrolled with a minimum of 15 credits in their program, being over 18 years old, and having at least 25 teeth, a criterion established to avoid alterations related to occlusal disharmonies. Students were excluded if they had diagnoses related to cognitive, neurological, endocrine, or cardiac health conditions, being pregnant or breastfeeding, having orthodontic appliances, undergoing treatment with neuroleptic or anticholinergic medications in the past six months, or in the process of withdrawing from the university.

Thus, the study sample included 168 students, distributed as follows: 41 enrolled in physiotherapy, 63 in occupational therapy and 64 in dentistry.

Participation in the project was carried out in person during the active academic period, excluding the initial and final phases of the semester. This decision was justified by considering that the key variables were the number of courses enrolled in and the consistent academic rigor and workload typical of health programs during the academic period. Participants completed the surveys through digital forms, which were distributed within their academic program facilities using printed QR codes.

The survey, adapted by Zaldívar in 2016 and previously validated in Colombia as the List of Vulnerability Indicators (16), has a Cronbach alpha coefficient of 0.884, indicating high reliability. The instrument consists of 20 items that assess symptoms commonly associated with vulnerability to stress. The items require the student to indicate the presence, frequency or absence of each symptom, using a scale from 0 to 4, where: 0 corresponds to "not at all frequent," 1 to "infrequent," 2 to "moderately present," 3 to "frequently present," and 4 to "very frequently present." The classification of the results is based on the score obtained: between 1 and 25 is considered "low," between 26 and 69 "moderate," and 70 or more "high."

To analyze self-perception of bruxism, the self-administered questionnaire proposed by Paesani, *et al.* in 2013 (17) (see appendix at the end of the article) was used. This questionnaire includes five items: three related to nocturnal bruxism and the last two concerning self-perceptive diagnosis of awake bruxism. All items were answered dichotomously with "Yes" if the habit occurred more than three times per week or for several hours per day, or "No" if the frequency was not clinically relevant, meaning less than three times per week and/or for only a few hours per day. If any of items 1, 2, or 3 were answered "Yes," it was considered as “possible sleep bruxism.” Similarly, if either item 4 or 5 was answered "Yes," it was classified as “possible awake bruxism,” referring to the indication of a person engaging in involuntary activities such as clenching or grinding teeth while awake.

Since this study involved the participation of human beings, the approval of the Human Ethics Committee of the Universidad del Valle was obtained on November 21, 2022, through the approval minute with internal code 093-022. The research was carried out in compliance with article 11 of Resolution 8430 of the Ministry of Social Protection and following the ethical principles established in the Declaration of Helsinki of the World Medical Association for medical research in human beings. In accordance with Resolution 8430, this study was classified as minimal risk.

Data Analysis

The data were recorded in an Excel sheet and the SPSS® 26 (IBM) program for macOS 13.6 was used for the analysis. The variables were named, labeled, and values were assigned for each code.

The statistical analysis included the calculation of measures of central tendency and dispersion for the numerical variables: average stress vulnerability score and number of problem items. Shapiro-Wilk and Levene tests were performed to verify whether the data had a normal distribution and equality of variance, respectively. The results of each instrument are presented in frequency tables with counts and percentages according to the value scale (Tables 1-3).

Hypothesis testing was carried out between groups for each instrument according to the ordinal scale (Likert) of each of the items that constitute the responses using the Kruskal Wallis H test between

programs. For the contrast between the degree of vulnerability to stress and the presence of bruxism (nocturnal or wakefulness), the Chi square test was used. This analysis was complemented with the contrast for independent samples between the academic programs using the Student t test for the scores (sum and averages) of stress vulnerability. In addition, boxplot graphs were made in the Stata IC15 statistical package (Figures 1-5).

Finally, a logistic regression was performed to assess the relationship between the variables of interest, adjusting for sociodemographic factors such as sex, academic program, and level of vulnerability to stress. A reliability of 95 % and a significance of 5 % were established.

RESULTS

Vulnerability to Stress

The study included 168 students of physiotherapy, occupational therapy, and dentistry (5-year programs distributed between the first and tenth semester). The majority were women (76.19 %), single (94.60 %), and belonged to socioeconomic level 2 (36.3 %), although the sample ranged from stratum 1 to 5. It is worth mentioning that the socioeconomic level classifies people or groups according to their economic situation and access to resources, on a scale ranging from level 1 (the lowest) to higher levels. The most common semester was the fourth, followed by the sixth and seventh, with an even distribution among the programs.

Regarding employment status, most participants were studying exclusively (78 %), while a smaller percentage combined study with formal work (10.7 %) or independent work (11.3 %). Among occupational therapy students, formal employment was more common, while in dentistry, independent work predominated. These sociodemographic characteristics allow us to analyze their relationship with stress and bruxism, considering the differences according to the academic program, gender and socioeconomic situation (Table 1).

TABLE 1
Characteristics of Students by Academic Program*

Variable		Academic Program				p
		Physiotherapy	Occupational Therapy	Dentistry	Total	
		n (%)	n (%)	n (%)	n (%)	
Gender	Female	31 (75.61)	50 (79.37)	47 (73.44)	128 (76.19)	0.785
	Male	10 (24.39)	13 (20.63)	17 (26.56)	40 (23.81)	
Marital Status	Common-law union	4 (9,80)	1 (1,60)	3 (4,70)	8 (4,80)	0.261
	Single	37 (90,20)	61 (96,80)	61 (95,30)	159 (94,60)	
	Married	0 (0,00)	1 (1,60)	0 (0,00)	1 (0,60)	
Socioeconomic level	1	9 (22,00)	16 (25,40)	14 (21,90)	39 (23,20)	0.058
	2	20 (48,80)	25 (39,70)	16 (25,00)	61 (36,30)	
	3	11 (26,80)	16 (25,40)	19 (29,70)	46 (27,40)	
	4	1 (2,40)	6 (9,50)	13 (20,30)	20 (11,90)	
	5	0 (0,00)	0 (0,00)	2 (3,10)	2 (1,20)	
Semester	1	0 (0,00)	2 (3,20)	0 (0,00)	2 (1,20)	0.004
	2	8 (19,50)	12 (19,00)	10 (15,60)	30 (17,90)	
	3	0 (0,00)	0 (0,00)	0 (0,00)	0 (0,00)	
	4	14 (34,10)	10 (15,90)	17 (26,60)	41 (24,40)	
	5	5 (12,20)	0 (0,00)	0 (0,00)	5 (3,00)	
	6	6 (14,60)	17 (27,00)	13 (20,30)	36 (21,40)	
	7	6 (14,60)	15 (23,80)	12 (18,80)	33 (19,60)	

	8	0 (0,00)	0 (0,00)	0 (0,00)	0 (0,00)	
	9	2 (4,90)	6 (9,50)	12 (18,80)	20 (11,90)	
	10	0 (0,00)	1 (1,60)	0 (0,00)	1 (0,60)	
Employment status	Unemployed	34 (82,90)	45 (71,40)	52 (81,30)	131 (78,00)	0.054
	Employed	5 (12,20)	11 (17,50)	2 (3,10)	18 (10,70)	
	Self-employed	2 (4,90)	7 (11,10)	10 (15,60)	19 (11,30)	

* Significant values are identified in the variable "semester" (p=0.004), which indicates that dentistry students focused on advanced levels. Likewise, in the variable "employment status" (p=0.054), occupational therapy showed a higher proportion of formal employment and dentistry highlighted independent work.

Most participants (52.4 %) showed low vulnerability to stress, with no significant differences between academic programs. However, 47.6 % showed intermediate, high, or extreme levels of vulnerability, with the extreme level predominating in physiotherapy students (14.6 %), followed by dentistry (7.8 %) and occupational therapy (7.9 %).

Regarding self-perception of bruxism, 60.1 % of students reported daytime bruxism and 54.2 % reported nighttime bruxism. Occupational therapy students were those who showed greater awareness of the phenomenon, although the differences between the programs were not significant (Table 2)..

TABLE 2
Stress Vulnerability Level by Academic Program*

Variable		**Academic Program**				**p**
		Physical Therapy	**Occupational Therapy**	**Dentistry**	**Total**	
		n (%)	**n (%)**	**n (%)**	**n (%)**	
Level of vulnerability to stress	Low vulnerable	23 (56,10)	33 (52,40)	32 (50,00)	88 (52,40)	0.250
	Vulnerable	4 (9,80)	18 (28,60)	19 (29,70)	41 (24,40)	
	Seriously vulnerable	8 (19,50)	7 (11,10)	8 (12,50)	23 (13,70)	
	Extremely vulnerable	6 (14,60)	5 (7,90)	5 (7,80)	16 (9,50)	
Possible sleep bruxism	No	22 (53,70)	24 (38,10)	31 (48,40)	77 (45,80)	0.259
	Yes	19 (46,30)	39 (61,90)	33 (51,60)	91 (54,20)	
Possible wakefulness bruxism	No	17 (41,50)	23 (36,50)	27 (42,20)	67 (39,90)	0.785
	Yes	24 (58,50)	40 (63,50)	37 (57,80)	101 (60,10)	

* Significant results identify a higher prevalence of extreme levels of vulnerability to stress in physiotherapy students (14.6%), compared to dentistry (7.8%) and occupational therapy (7.9%).

Psychosomatic disorders, associated with headaches, malaise, fatigue and lack of energy, were reported most frequently by dental students, followed by occupational therapy and physiotherapy students. In the item "feeling of discomfort and tension," 87.8 % of physiotherapy students presented this symptom to some degree, with "frequently present" being the most common value (46.3 %). In occupational therapy, 82.5 % reported this discomfort, with the value "moderately present" predominating (41.3 %). Dental students, although also affected, showed less frequency, with 76.6 % indicating some degree of discomfort (Figure 1).

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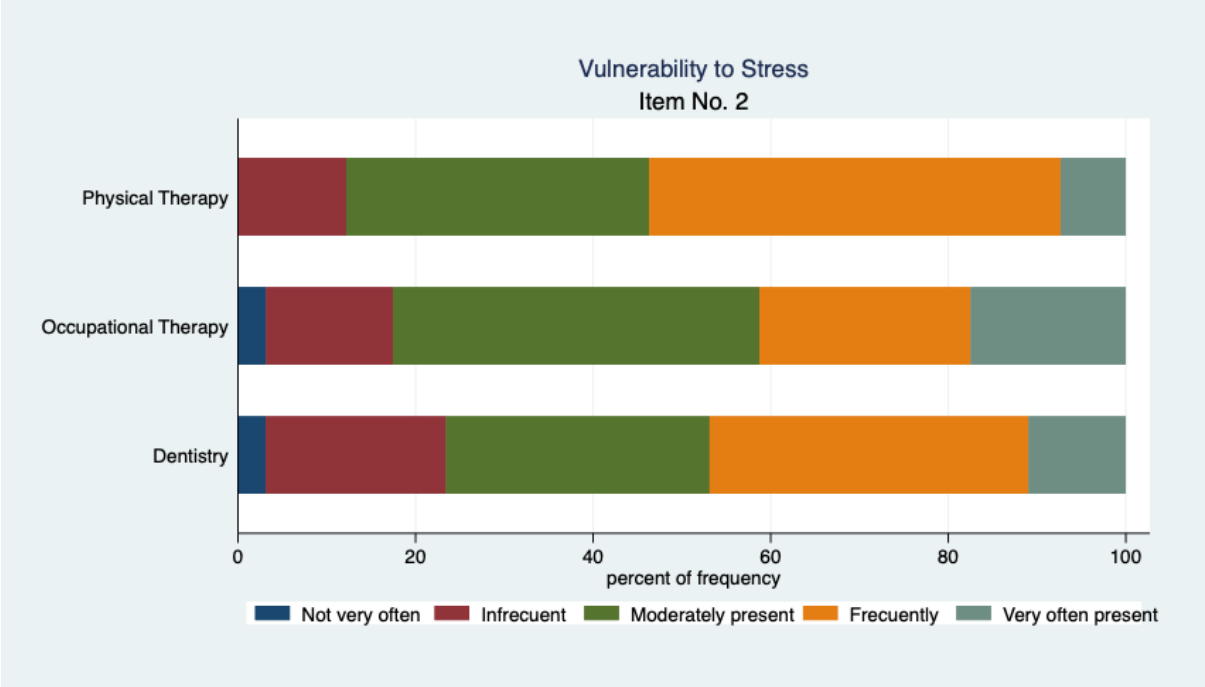

FIGURE 1
Frequency of the Perception of Feelings of Discomfort and Tension by Students of the Three Academic Programs

The feeling of "feeling tired most of the time, even after sleeping" was reported by the majority of students. In physiotherapy, 80.5 % reported this symptom to some degree, with "frequently present" being the most common value (41.5 %). In occupational therapy, 84.1 % reported experiencing this sensation, with the "moderately present" value predominating (39.7 %). In dentistry, 85.9% of students reported it, with the "frequently present" value again standing out as the highest (42.2 %) (Figure 2).

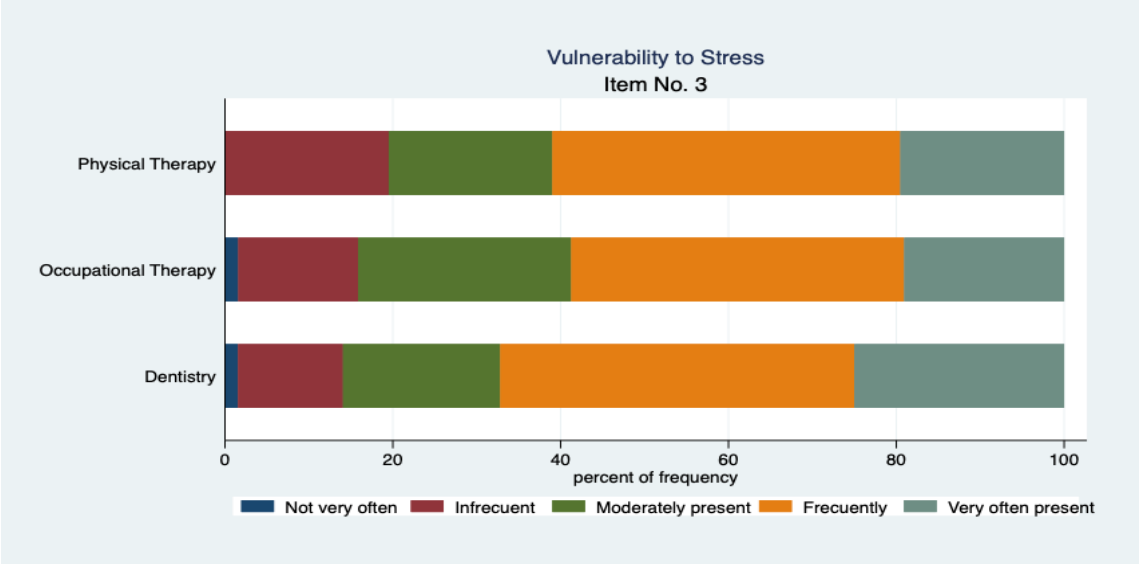

FIGURE 2
Frequency of Perception by Students of the Three Academic Programs of Feeling Tired Most of The Time, Even After Sleeping

"Feeling of lack of energy or drive to perform daily tasks" was reported with some degree of frequency by 87.8 % of physiotherapy students, 84.1 % of occupational therapy students, and 85.9 % of dentistry students. In physiotherapy, the most common value was "moderately present" (43.9 %), while in occupational therapy and dentistry the value "frequently present" predominated (38.1 % and 35.9 %, respectively) (Figure 3).

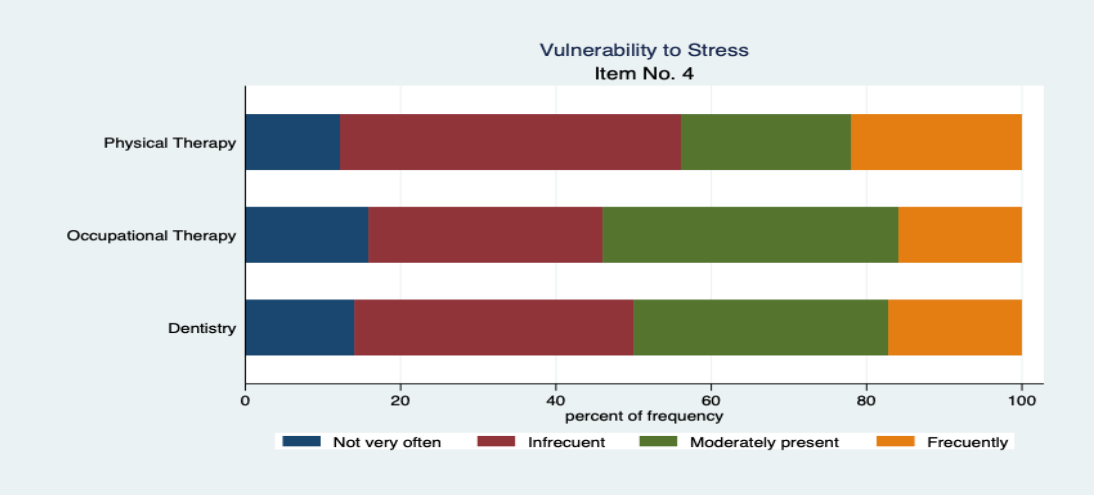

FIGURE 3
Frequency of the Perception of a Feeling of Lack of Energy/Drive in the Performance of Daily Tasks by Students of the Three Academic Programs

Indicators related to changes in habits, difficulties in daily activities and altered behaviors were presented at different levels of frequency without significant differences between the programs. However, the item "being worried about something" showed a high frequency in dentistry (95.3 %), followed by occupational therapy (85.7 %) and physiotherapy (75.6 %), with significant differences between the programs. In physiotherapy, 75.6 % of participants reported this symptom, although it was not considered significant. In occupational therapy, 85.7 % expressed concern with some frequency, with the value "frequently present" predominating (36.5 %). In dentistry, 95.3 % expressed concern, with "frequently present" being the most common value (34.4%) (Figure 4).

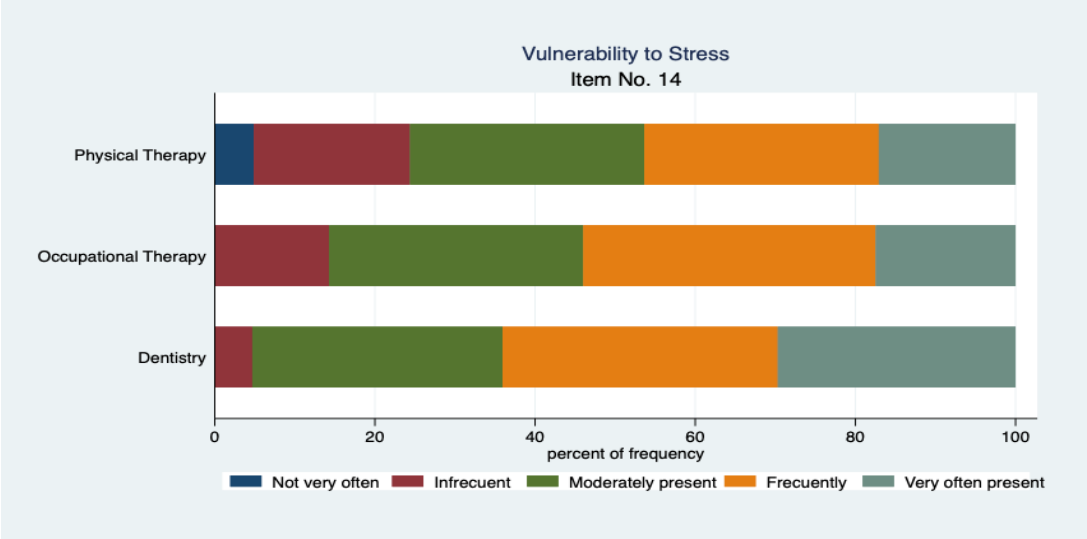

FIGURE 4
Frequency of the Feeling of “Being Worried About Something” by Students of the Three Academic Programs

Self-perception of Bruxism

Logistic regression models were developed for the variable "possible bruxism" (sleep or awake), and crude and adjusted association measures were calculated considering sex, academic program, socioeconomic level, employment status, and stress vulnerability. In the adjusted model, men were found to have a 48% lower probability of bruxism compared to women (OR = 0.52 [95% CI: 0.239–1.148]). When analyzing academic programs, occupational therapy students showed a 20% higher probability of bruxism (OR = 1.2 [95% CI: 0.497–2.939]), while dentistry students exhibited a 9% lower probability (OR = 0.910 [95% CI: 0.361–2.297]), with physiotherapy as the reference group.

Regarding socioeconomic status, a greater correlation was observed with increasing level, with stratum 5 being three times more likely to present bruxism compared to stratum 1 (OR = 3.010 [95 % CI: 0.153 - 59.056]). According to employment status, employed students have a 48 % higher probability of bruxism (OR = 1.48 [95 % CI: 0.403 - 5.456]) compared to the unemployed.

In relation to vulnerability to stress, the risk of bruxism increases with increasing vulnerability. Students with severe vulnerability are 6.6 times more likely to present bruxism compared to those with low vulnerability (OR = 6.658 [95 % CI: 1.757 - 25.232]) (Table 3, Figure 5).

TABLE 3
Association between Sociodemographic Factors and Stress Vulnerability with bruxism

Variable	OR	OR IC95%	p	OR*	OR IC95%	p
Female	1			1		
Male	0.44	0.216 - 0912	0.027	0.524	0.239 - 1.148	0.106
Fisioterapia	1			1		
Physical Therapy	1.23	0.550 - 2.757	0.612	1.209	0.497 - 2.939	0.676
Dentistry	0.97	0.438 – 2.150	0.942	0.910	0.361 - 2.297	0.842
Stratum 1	1			1		
Stratum 2	1.684	0.744 - 3.812	0.211	1.713	0.702 - 4.178	0.237
Stratum 3	1.35	0.572 - 3.189	0.494	1.551	0.615 - 3.915	0.352
Stratum 4	2.217	0.706 - 6.959	0.173	2.472	0.669 - 9.140	0.175
Stratum 5	0.95	0.055 - 16.293	0.972	3.010	0.153 - 59.056	0.468
Unemployed	1			1		
Employee	2.533	0.791 - 8.113	0.118	1.483	0.403 - 5.456	0.553
Self-employed	0.995	0.375 - 2.637	0.992	0.749	0.257 - 2.185	0.597
Low vulnerability	1			1		
Stress vulnerable	2.647	1.199 - 5.845	0.016	2.555	1.091 - 5.985	0.031
Severely vulnerable	7.302	2.023 - 26.35	0.002	6.658	1.757 - 25.232	0.005
Extremely vulnerable	1.825	0.611 - 5.457	0.281	1.549	0.497 - 4.829	0.451

OR*: Razón de oportunidad ajustado.

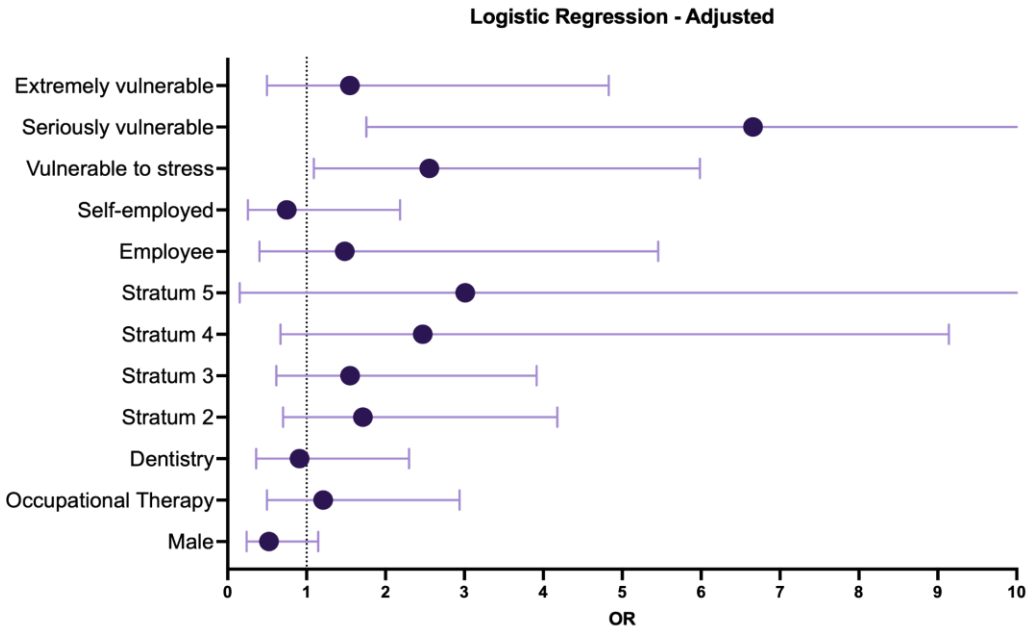

FIGURE 5
Adjusted Odds Ratios (ORs) of Bruxism by Sociodemographic Factors and Level of Vulnerability to Stress

DISCUSSION

The aim of this study was to determine the relationship between vulnerability to stress and self-perception of bruxism in undergraduate students of physiotherapy, occupational therapy and dentistry and to analyze possible differences between these academic programs at the Universidad del Valle, in Cali, Colombia. The aim was to identify whether there were differences between these academic programs, an area with little evidence, especially at the local level. Although stress is a widely documented phenomenon in university students, the specific relationship between it and bruxism in the context of health careers has been little explored. Therefore, this study represents a relevant contribution by providing new approaches and data to the discussion on this topic.

The results indicate that a significant proportion of students experience high levels of stress vulnerability from the early semesters. This finding aligns with previous studies in the academic field, particularly among first-year students. Research, such as that by Rodríguez, *et al.* (2011), has identified these students as particularly vulnerable to stress, which can be attributed to the adaptation process to university life, posing significant emotional and social challenges (18-21). In this context, the findings reinforce the idea that external factors, such as family, social, or personal issues, play a crucial role in the onset of stress, affecting the overall health of students. This result is consistent with literature showing that stress among university students can lead to psychosomatic disorders, such as bruxism, due to rumination and the accumulation of emotional tension (22-25).

Regarding stress vulnerability and its connection to bruxism, the results of this study align with international research, such as the 2019 study by Von Bischhoffshausen, *et al.* (26). That study identified stress as a significant factor in the prevalence of bruxism among dentistry students, with higher frequency in women. However, it is important to contextualize these comparisons: Von Bischhoffshausen, *et al.* focused on dentistry students from the Pontificia Universidad Católica de Chile, within a different socioeconomic and cultural environment. Although similarities in findings exist, differences in academic training, available resources, and socioeconomic factors may influence the manifestation of these

disorders. At Universidad del Valle, the socioeconomic diversity of its student population could explain certain variations in bruxism prevalence and stress responses observed.

It is crucial to highlight that dentistry students in this study reported a higher frequency of psychosomatic disorders, suggesting that the academic demands and clinical skills specific to this field may be associated with higher stress levels. This finding aligns with studies such as Rodríguez, *et al.* (2014) (20), which demonstrate the relationship between physical exhaustion, negative attitudes, and professional insecurity among health students. The high pressures in dentistry, both theoretical and practical, can directly impact on students' self-confidence and, consequently, their academic performance. However, this study emphasizes that not only dentistry students but also those in physiotherapy and occupational therapy require interventions to manage stress, as these programs also demand practical and behavioral skills that are vulnerable to the effects of chronic stress.

The analysis across academic programs revealed that, although stress vulnerability was similar, dentistry students more frequently reported thoughts related to rumination and excessive worry. This phenomenon is concerning, as rumination is associated with cognitive and emotional impairments that affect concentration and academic performance (22). This finding aligns with previous studies, such as Ordoñez, *et al.* (2016) (7), which reported high levels of anxiety and depression among dentistry students. However, it is important to consider that each academic context has unique characteristics that may influence how stress manifests and how students manage it.

The study also found that socioeconomic and occupational factors influence the likelihood of presenting bruxism, although this finding is novel and lacks extensive research in the literature related to health students. Some studies indicate that students from low socioeconomic levels experience more stress due to economic insecurities (11). However, the results of this research indicate that students from high strata show a greater likelihood of suffering from bruxism. This difference could be explained by the high academic and social expectations they face, which increases their emotional pressure and, consequently, their vulnerability to stress.

Regarding work factors, this study showed that those who only study or who are employed but do not work independently exhibit a higher risk of developing bruxism. This situation could be linked to the exclusive concentration on academic demands and economic pressures, which in turn generate a cycle of chronic stress.

The limitations of the study, such as the small sample size, restrict the ability to generalize the results and delve deeper into the differences between academic groups. A larger number of participants would provide greater precision and allow the findings to be extrapolated to other university populations. In addition, the cross-sectional design does not make it possible to establish causal relationships between vulnerability to stress and bruxism, which makes it difficult to interpret the results in terms of causes and effects. Therefore, longitudinal studies are required to evaluate how these phenomena evolve over time in health students and how they could be modified with specific interventions.

CONCLUSIONS

The findings of the study reveal that students of physiotherapy, occupational therapy, and dentistry have experienced varying levels of vulnerability to stress, which shows a predisposition to the phenomenon. This could be related to particular situations in everyday life, outside the academic field, which affect the individual, increasing their sensitivity and exposure to stress, which impacts on their academic performance and general well-being. In particular, dentistry students reported a higher frequency of psychosomatic disorders, such as headaches, malaise, fatigue and lack of energy. In addition, they showed higher levels of worry about problems compared to students of the other programs.

The study identifies a relationship between vulnerability to stress and self-perception of bruxism. When vulnerability to stress increases, the probability of developing bruxism also increases, except in

those who are extremely vulnerable. We found that female gender acts as a risk factor for the development of bruxism. These results underline the importance of addressing stress and bruxism in university students, especially in health programs. In addition, they highlight the relevance of considering social determinants when analyzing vulnerability to stress and the risk of developing bruxism. We recommend conducting studies with a larger number of samples and involving students from different health programs to identify how the phenomenon occurs in each population and justify intervention mechanisms.

RECOMMENDATIONS

It is recommended to expand the sample and diversify the disciplines evaluated to obtain more generalizable results. It is essential to implement preventive strategies for the management of stress and bruxism, considering gender differences and levels of vulnerability. In addition, longitudinal follow-ups are necessary to evaluate their long-term impact. It is suggested to promote interdisciplinary collaboration and to deepen the analysis of socioeconomic factors in the relationship between stress and bruxism.

CONFLICT OF INTEREST

The authors declare no conflicts of interest related to the conduct of this study or the publication of its results. Furthermore, they emphasize that the financial support and collaborations cited, such as scholarships and institutional backing mentioned, did not influence the study's design, execution, or interpretation of the findings.

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Appendix

Anexo 1: Cuestionario sobre autopercepción del bruxismo Universidad del Valle.

1. ¿Eres consciente del hecho que rechinas los dientes mientras duermes?

a. Sí

b. No

2. ¿Alguien te ha comunicado que rechinas los dientes mientras duermes?

a. Sí

b. No

3. Al despertar por la mañana o al despertar durante la noche, ¿tiene la mandíbula apretada o fatigada?

a. Sí

b. No

4. ¿Aprietas los dientes o empujas la mandíbula mientras estás despierto/a?

a. Sí

b. No

5. ¿Rechinas los dientes mientras estás despierto/a?

a. Sí

b. No