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Correlation between temporomandibular disorders and psychological distress in health sciences university students*

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ABSTRACT

Objective: To determine the correlation between temporomandibular disorders (TMD) and psychological distress in health sciences university students. **Materials and methods:** A correlational study was conducted in a population of 2,302 students, and a sample size of 329 participants was calculated. The main variables analyzed were TMD, assessed using the Fonseca Anamnestic Index, and psychological distress, measured with the 12-item General Health Questionnaire (GHQ-12). Academic program was used as a covariate. **Results:** Mild psychological distress was the most frequent category, at 33.13% (n = 109), while moderate TMD had the highest prevalence, at 55.93% (n = 184). No statistically significant correlation was found between the two variables in the total sample (rho = 0.072; p = 0.194). However, analysis by academic program showed a significant correlation among Dentistry students, whereas no statistically significant associations were observed among Human Medicine, Nursing, or Social Work students. **Conclusions:** No statistically significant correlation was found between TMD and psychological distress in the total sample of health sciences students. However, subgroup analysis showed a significant positive correlation among Dentistry students.

Keywords: temporomandibular joint; psychological distress; university students.

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INTRODUCTION

Temporomandibular disorders (TMD) comprise a group of conditions that affect the temporomandibular joint and masticatory muscles, characterized by pain, limited mouth opening, joint sounds, and other clinical manifestations. From a biopsychosocial perspective, TMD are not regarded solely as mechanical disorders; rather, they interact with psychological and social factors. Recent studies have shown that psychological stress, anxiety, and other emotional states are associated with a higher prevalence and greater severity of TMD, as evidenced by a significant association between these disorders and symptoms of stress, anxiety, and depression (1,2).

Recent research has shown that both sleep and awake bruxism are associated with temporomandibular pain and dysfunction, as well as with psychological factors such as stress. This supports the hypothesis that mechanisms such as sympathetic activation, persistent muscle tension, and sensitization of nociceptive circuits mediate the interaction among these elements. In this regard, the biopsychosocial model incorporates neuroendocrine factors (cortisol response), psychological factors (stress and anxiety), and behavioral factors (bruxism and parafunctional habits) as interrelated mechanisms that contribute to both the development and chronicity of orofacial pain in TMD (1–4). In recent years, the prevalence of these disorders has increased, particularly among children and adolescents. These conditions are common among young people, with reported prevalence rates of up to 34.9% in Latin America and 65% among dental students, and have been associated with psychoemotional factors (3).

Psychological distress encompasses various cognitive, emotional, and behavioral disturbances that may affect cognitive functioning, academic performance, and social relationships. Its most common manifestations include anxiety, characterized by excessive worry and persistent fears, and stress, understood as a response to challenging or demanding situations (5,6). These disturbances are associated with psychosocial, biological, genetic, and familial factors, as well as substance use (7). Among university students, the prevalence of mental disorders reaches 39.4%, with anxiety and depressive disorders being the most prevalent. Furthermore, this situation is more common among women (42.4%) and may worsen in the absence of timely treatment (8–10).

This study provides relevant knowledge for psychology and dentistry by highlighting the potential relationship between stress, anxiety, and TMD. It also promotes a comprehensive, interdisciplinary approach that may facilitate the early detection of these conditions and support more psychologically informed dental care among university students. For these reasons, this study aimed to determine the correlation between TMD and psychological distress among health sciences university students.

MATERIALS AND METHODS

A quantitative cross-sectional study was conducted. The study population consisted of health sciences students in the seventh through ninth academic semesters enrolled in the professional schools of Human Medicine, Nursing, Dentistry, and Social Work at Universidad Señor de Sipán, located in the district of Pimentel, Lambayeque, Peru. The total population comprised 2,302 students, distributed as follows: 604 from Human Medicine, 1,336 from Nursing, 311 from Dentistry, and 51 from Social Work. Based on the total population, the calculated sample size was 329 students. Subsequently, proportional stratified sampling by professional school was performed, selecting 86 Human Medicine students, 191 Nursing students, 44 Dentistry students, and 8 Social Work students. Data were collected in June 2025.

The inclusion criteria were students aged 18 or older of either sex who were enrolled in the seventh through ninth academic semesters of the aforementioned programs. The exclusion criteria included refusal to participate or refusal to sign the informed consent form; preexisting medical conditions affecting the temporomandibular joint (TMJ); history of orthodontic treatment or surgery; physical or mental disabilities that prevented completion of the instruments; and pregnancy.

The study variables were TMD and psychological distress, whereas health sciences programs were considered covariates. Two previously validated questionnaires were used for data collection. The first, the Simplified Fonseca Anamnestic Index, determines the presence and severity of TMD through 10 questions using a Likert-type scale with three response options: "yes" (10 points), "sometimes" (5 points), and "no" (0 points). The total score was used to classify cases as follows: no dysfunction (0–20), mild dysfunction (20–40), moderate dysfunction (45–65), and severe dysfunction (70–100) (11).

The second instrument, the General Health Questionnaire (GHQ-12), assesses psychological distress, specifically symptoms of emotional distress, anxiety, depression, social dysfunction, and loss of self-confidence. It consists of 12 items worded in both positive and negative terms, which are answered using a Likert-type scale. The final score ranges from 0 to 36 points, with higher scores indicating greater symptom severity. Using a cutoff point of ≥11, the results were categorized as follows: "psychological well-being or mild risk" (0–10 points), indicating no significant disturbances and an adequate state of mental health; "moderate distress with

a possible clinical problem" (11–15 points); and "severe distress with a high clinical probability" (16–36 points) (12). Both questionnaires were administered in the classrooms during scheduled theoretical classes and took approximately 8 minutes to complete.

Both variables were categorized for statistical analysis. Initially, descriptive analysis was performed using absolute and relative frequencies to characterize the distribution of the sample. Subsequently, inferential analysis was conducted to assess the correlation between TMD and psychological distress using Spearman's rho correlation coefficient. Data processing and analysis were performed using IBM SPSS Statistics version 29. A 95% confidence level was considered, and a p-value < 0.05 was used as the criterion for statistical significance.

The study was approved on April 30, 2025, by the Scientific Ethics Committee of the Faculty of Health Sciences of Universidad Señor de Sipán, Peru. Informed consent was obtained from each participant. The authors declare that artificial intelligence (ChatGPT) was used exclusively for basic correction of grammar, spelling, and punctuation, as well as for support in writing and summarizing.

RESULTS

Regarding the frequency of psychological distress among health sciences university students, 33.13% (n = 109) had mild distress, making this the most frequent category. This was followed by psychological well-being, identified in 31.31% (n = 103) of the participants. In addition, 26.75% (n = 88) exhibited moderate distress, whereas 8.81% (n = 29) presented with severe distress (Table 1).

Regarding the severity of TMD, the moderate level was the most frequent, accounting for 55.93% (n = 184) of the participants. Meanwhile, 32.22% (n = 106) presented with mild TMD, followed by severe TMD in 6.69% (n = 22) of those evaluated. A total of 5.17% (n = 17) showed no dysfunction (Table 2).

Table 1. Distribution of psychological distress among health sciences university students.

Psychological distress	n	%
Psychological well-being	103	31.31
Mild distress	109	33.13
Moderate distress	88	26.75
Severe distress	29	8.81
Total	329	100.00

Table 2. Severity of temporomandibular disorders among health sciences university students.

Temporomandibular disorders	n	%
No dysfunction	17	5.16
Mild	106	32.22
Moderate	184	55.93
Severe	22	6.69
Total	329	100.00

When the correlation between the two variables was analyzed, students with mild or moderate TMD tended to present with mild or moderate psychological distress. In contrast, those without TMD or with severe TMD reported a lower frequency of psychological distress. However, the correlation analysis showed no statistically significant association between the variables (rho = 0.072; p = 0.194) (Table 3).

Table 3. Relationship between temporomandibular disorders and psychological distress among health sciences university students, 2025.

Temporomandibular disorders	Psychological distress								rho	p-value
	Psychological well-being		Mild distress		Moderate distress		Severe distress			
	n	%	n	%	n	%	n	%		
No dysfunction	5	1.52	6	1.82	3	0.91	3	0.91	0.072	0.194
Mild	36	10.94	39	11.85	28	8.51	3	0.91		
Moderate	55	16.72	60	18.24	49	14.89	20	6.08		
Severe	7	2.13	4	1.22	8	2.43	3	0.91		
Total	103	31.31	109	33.13	88	26.75	29	8.81		

When stratifying the relationship between TMD and psychological distress by professional program, Human Medicine showed that moderate TMD was the most frequent category, occurring primarily in conjunction with psychological well-being (n = 18), moderate distress (n = 16), and mild distress (n = 10). However, statistical analysis using Spearman's correlation coefficient showed no significant correlation in this group (rho = 0.041; p = 0.713). Similarly, in Nursing, moderate TMD was also a predominant category and was most frequently associated with mild distress (n = 40), psychological well-being (n = 34), and moderate distress (n = 25), with no statistically significant correlation identified (rho = 0.041; p = 0.570). In Dentistry, the most frequent pattern was mild TMD associated with mild distress (n = 12), with a weak but statistically significant positive correlation (rho = 0.349; p = 0.021), suggesting a possible association between the two variables in this program. Finally, in Social Work, a low overall frequency was observed across all categories, with the coexistence of moderate TMD and moderate distress being the most notable pattern (n = 3). However, the correlation did not reach statistical significance (rho = 0.592; p = 0.161). Overall, the correlation between TMD and psychological distress was not statistically significant in three of the professional programs and was statistically significant only in the School of Dentistry (Table 4).

Table 4. Relationship between temporomandibular disorders and psychological distress among health sciences university students according to academic program.

Academic program	Temporomandibular disorders	Psychological distress								rho	p-value
		Psychological well-being		Mild distress		Moderate distress		Severe distress			
		n	%	n	%	n	%	n	%		
Human Medicine (n = 86)	No dysfunction	2	2.33	0	0.00	1	1.16	1	1.16	0.041	0.713
	Mild	8	9.30	9	10.47	11	12.79	1	1.16		
	Moderate	18	20.93	10	11.63	16	18.60	9	10.47		
	Severe	0	0.00	0	0.00	0	0.00	0	0.00		
	Total	28	32.56	19	22.09	28	32.56	11	12.79		
Nursing (n = 191)	No dysfunction	2	1.05	7	3.66	2	1.05	2	1.05	0.041	0.570
	Mild	22	11.52	17	8.90	12	6.28	1	0.52		
	Moderate	34	17.80	40	20.94	25	13.09	8	4.19		
	Severe	7	3.66	5	2.62	6	3.14	1	0.52		
	Total	65	34.03	69	36.13	45	23.56	12	6.28		
Dentistry (n = 44)	No dysfunction	0	0.00	0	0.00	0	0.00	0	0.00	0.349	0.021
	Mild	4	9.09	12	27.27	4	9.09	1	2.27		
	Moderate	3	6.82	7	15.91	6	13.64	5	11.36		
	Severe	0	0.00	0	0.00	1	2.27	1	2.27		
	Total	7	15.91	19	43.18	11	25.00	7	15.91		
Social Work (n = 8)	No dysfunction	0	0.00	0	0.00	0	0.00	0	0.00	0.592	0.161
	Mild	1	12.50	2	25.00	0	0.00	0	0.00		
	Moderate	1	12.50	0	0.00	3	37.50	0	0.00		
	Severe	0	0.00	0	0.00	1	12.50	0	0.00		
	Total	2	25.00	2	25.00	4	50.00	0	0.00		

DISCUSSION

The results of this study did not show a statistically significant association between TMD and psychological distress in most of the academic programs, except for Dentistry. This suggests that the interaction between these variables may vary according to the academic context and educational profile of each discipline.

Psychological well-being among university students and its relationship with TMD have been previously documented in different studies. Marpaung et al. (13) observed

high levels of anxiety among Indonesian students with TMD. In this study, although the frequency of severe psychological distress was lower than that of psychological well-being, relevant proportions of emotional distress were identified. These discrepancies may be explained by methodological differences between both studies. Whereas Marpaung et al. (13) classified students according to the severity of their TMD, in our study the questionnaire was administered to the entire population without prior segmentation. In addition, the instruments used differ: this study employed the GHQ-12, whereas the Asian study used the 21-item Depression, Anxiety, and Stress Scale (DASS-21).

The findings are partially consistent with those reported by Wahad et al. (14) in Pakistan, who identified a higher prevalence of TMD among medical sciences students compared with students in nonmedical programs. Similarly, in our study, a higher frequency of Human Medicine students with severe psychological distress associated with moderate TMD was observed. However, when the correlation was evaluated by academic program, only Dentistry showed a significant association. This suggests that academic demands and the educational characteristics of each program may influence the interaction between these variables; however, because of the cross-sectional study design, causal relationships cannot be established.

Furthermore, results are similar to those reported by Kumar et al. (15), who reported a TMD prevalence of 52.9% and a strong association with high levels of anxiety. In this study, students with moderate TMD tended to have higher levels of psychological distress, suggesting the coexistence of both conditions, including cases involving severe psychological distress. However, the overall correlation analysis was not statistically significant (rho = 0.072; p = 0.194), indicating that, although a descriptive trend was observed, there was insufficient statistical evidence to confirm this association in the overall sample.

With regard to the findings reported by Rodríguez-Betancourt et al. (16) in Cuba, whose case-control study evaluated the relationship between TMD and anxiety using the Helkimo Index and the State-Trait Anxiety Inventory (STAI), the authors showed substantial comorbidity between both conditions, particularly in relation to joint and muscle pain. These findings support the influence of psychoemotional factors on TMD and are consistent with the descriptive trend observed in our study, in which students with greater psychological distress presented with more severe TMD. Although the population in that study consisted of adults in a clinical setting, unlike the young university population in this research, both studies suggest that anxiety plays an important role in the presence of TMD, regardless of age or population context.

Erkan et al. (17) reported in Turkey, whose study compared patients with myofascial TMD and bruxism with a healthy control group by assessing muscle thickness, mechanosensitivity, craniofacial pain, functional disability, and emotional stress, significant differences were found across all indicators. These findings suggest that TMD affect both the craniocervical and cervical regions. Despite differences in methods and populations (adult clinical patients versus university students), both studies indicate that these disorders are associated with physiological and psychoemotional manifestations, reinforcing the importance of evaluating TMD from a comprehensive perspective that considers physical, emotional, and behavioral symptoms.

Similarly, Gómez et al. (18) conducted a cross-sectional study in Cuba among Dentistry students to assess the association between TMD and anxiety using the Fonseca questionnaire and the Zung Anxiety Scale. The authors reported that moderate anxiety was associated with TMD in 32.43% of the students, and that the prevalence of TMD was significantly higher among female students (75.68%). These findings directly support our results in the School of Dentistry, where a weak but statistically significant positive correlation was observed (rho = 0.349; p = 0.021). Thus, these findings corroborate that higher levels of psychological distress are associated with greater TMD severity. Although the strength of the association was weak, its statistical significance indicates a significant relationship in this group, suggesting that emotional factors may act as triggers for TMD.

In addition, the results are also comparable to those of a Peruvian study conducted by Zevallos-Cabrera et al. (19), who reported a high prevalence of TMD and elevated levels of anxiety, stress, and depression among university students. In the same way, this study identified a substantial frequency of psychological distress and TMD, confirming the high burden of these conditions in the student population. Specifically, most students presented some degree of psychological distress, predominantly at mild and moderate levels, whereas TMD were primarily moderate in severity, reflecting a frequent coexistence of the two conditions. Overall, this high prevalence may be associated with factors such as academic stress and the demands inherent to health sciences education, underscoring the need to address these disorders by integrating physical and psychological aspects. Furthermore, few studies have specifically examined this relationship among health sciences students in comparable university settings, which lends relevance and novelty to the findings of this study.

In this study, the alternative hypothesis (H_1) proposed the existence of a correlation between TMD and psychological distress among health sciences students at a university, whereas the null hypothesis (H_0) stated that no such correlation existed. Based on the results

obtained, no statistically significant correlation was shown in the overall study population. Consequently, the research hypothesis was rejected, and the null hypothesis was retained.

Regarding the study limitations, first, the cross-sectional design prevents the establishment of causal relationships. Second, the small sample size in some academic programs, particularly Social Work, may have influenced the lack of statistical significance. In addition, the use of self-administered questionnaires introduces a risk of information bias due to the subjectivity of the responses, and the variability of instruments available in the scientific literature makes it difficult to directly compare results.

Longitudinal studies are recommended to evaluate the temporal progression of TMD and its relationship with psychoemotional variables. Similarly, it is advisable to increase the sample size in further studies. From an academic perspective, it is essential to implement preventive strategies and psychological support programs aimed at health sciences students, particularly during clinical training, in order to promote an interdisciplinary approach integrating mental health and dental practice.

CONCLUSIONS

No statistically significant correlation was found between TMD and psychological distress in the total sample of health sciences students. However, the analysis by academic program revealed a significant positive correlation in the School of Dentistry. These results suggest that the relationship between the two variables may be influenced by factors inherent to the academic and educational context. These findings highlight the importance of considering the specific characteristics of each discipline when addressing the physical and psychological health of the university student population.

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Statement on the use of artificial intelligence:
ChatGPT was used for basic correction of grammar, spelling, and punctuation, as well as for support in writing and summarizing. The authors reviewed and edited the resulting content, and assume full responsibility for the integrity and accuracy of the manuscript.

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REFERENCES

1. Wan J, Lin J, Zha T, et al. Temporomandibular disorders and mental health: shared etiologies and treatment approaches. J Headache Pain. 2025;26:52. doi:10.1186/s10194-025-01985-6
2. Belenda I, Montero J, Gómez C, et al. Evaluation of the relationship between bruxism and/or temporomandibular disorders and stress, anxiety, depression in adults: a systematic review and qualitative analysis. J Dent. 2025;156:105707. doi:10.1016/j.jdent.2025.105707
3. Dantas MC, Queiroz AN, Franco CS, et al. Prevalence of temporomandibular disorders and their association with oral behaviors, anxiety, and depression among medical and dental students in Brazil—a cross-sectional study. J Oral Facial Pain Headache. 2026;40(1):88-95. doi:10.22514/jofph.2026.008
4. Bezerra H, Alves RM, Nunes AD, et al. Prevalence and associated factors of common mental disorders in women: a sistematic review. Public Health Rev. 2021;42:1604234. doi:10.3389/phrs.2021.1604234

5. Moreno Y, Ros M, Sánchez MN, et al. Trastornos temporomandibulares y dolor muscular en pacientes mayores de 18 años. Multimed [Internet]. 2021;25(5):e1956. Available from: https://www.medigraphic.com/pdfs/multimed/mul-2021/mul215a.pdf
6. Solís-Martínez LJ, Barajas-Pérez VH, Almeda-Ojeda ÓE, et al. [Prevalence of temporomandibular disorders according to the simplified Fonseca anamnestic index in dentistry students of the Juárez University of the State of Durango, Mexico]. Rev Cient Odontol. 2021;9(2):e059. doi:10.21142/2523-2754-0902-2021-059 Spanish.
7. Chacón E, Xatruch D, Fernández M, et al. Generalidades sobre el trastorno de ansiedad. Rev Cúpula [Internet]. 2021;35(1):23-36. Available from: https://www.binasss.sa.cr/bibliotecas/bhp/cupula/v35n1/art02.pdfhttps://www.binasss.sa.cr/bibliotecas/bhp/cupula/v35n1/art02.pdf
8. Dos Santos E, Peinado B, Frazão D, et al. Association between temporomandibular disorders and anxiety: a systematic review. Front Psychiatry. 2022;13:990430. doi:10.3389/fpsyt.2022.990430
9. Mendoza J, Chusino ED, Ríos NS, et al. [Temporomandibular disorders associated with psychological factors]. UNESUM-Ciencias. 2024;8(3):202-16. doi:10.47230/unesum-ciencias.v8.n3.2024.202-216 Spanish.
10. Estrada-Araoz EG, Paricahua-Peralta JN, Paredes-Valverde Y, et al. [Prevalence of common mental disorders in university students]. Rev Cuba Med Mil [Internet]. 2023;52(4):e02302968. Available from: https://revmedmilitar.sld.cu/index.php/mil/article/view/2968/2263 Spanish.
11. Sánchez-Torrelo CM, Zagalaz-Anula N, Alonso-Rojo R, et al. Transcultural adaptation and validation of the Fonseca anamnestic index in a Spanish population with temporomandibular disorders. J Clin Med. 2020;9(10):3230. doi:10.3390/jcm9103230
12. Chávez-Espinoza JH, Castillo-Romero PC, Ruiz-Reyes RE, et al. [Peruvian adaptation and validation of the General Health Questionnaire (GHQ-12) in healthcare workers]. Iatreia. 2023;36(3):353-64. doi:10.17533/udea.iatreia.177 Spanish.
13. Marpaung C, Ujin AU, Hanin I, et al. Psychological distress and well-being: their association with temporomandibular disorder symptoms. Cranio. 2024;42(3):285-91. doi:10.1080/08869634.2021.1971449
14. Khan MW, Zaigham AM, Inayat N, et al. Prevalence and severity of temporomandibular disorders among medical and non-medical undergraduate students. Med Forum Mon [Internet]. 2022;33(11):119-23. Available from: https://medicalforummonthly.com/index.php/mfm/article/view/1394
15. Kumar L, Naik Z, Panwar A, et al. Prevalence of temporomandibular disorders and their correlation with gender, anxiety and depression in dental students – A cross-sectional study. J Indian Acad Oral Med Radiol. 2022;34(3):281-5. doi:10.4103/jiaomr.jiaomr_65_22
16. Rodríguez-Betancourt MM, Yero-Mier IM, De Castro-yero JL, et al. [Anxiety Influence on the development of temporomandibular disorders]. Rev Inf Cient [Internet]. 2022;101(5):e3951. Available from: https://www.redalyc.org/journal/5517/551773979006/html/ Spanish.
17. Kilinc HE, Onan D, Ulger O. Investigation of masticatory muscle thickness and mechanosensitivy of cervical and masticatory muscles in myofascial temporomandibular disorder patients with bruxism: a cross-sectional study. Musculoskelet Sci Pract. 2024;70:102919. doi:10.1016/j.msksp.2024.102919
18. Gómez RM, Peláez OM, Milán MS, et al. Anxiety and temporomandibular disorders in stomatology students. Multimed [Internet]. 2025;29:e3014. Available from: https://revmultimed.sld.cu/index.php/mtm/article/view/3014
19. Zevallos-Cabrera P, Céspedes-Martínez J, Bravo-Cucci S, et al. [Prevalence of temporomandibular disorders and associated factors in students at a private university in Lima-Peru]. Gac Méd Caracas. 2022;130(4):759-71. doi:10.47307/GMC.2022.130.4.11 Spanish.