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Prevalence and Associated Factors of Self-Reported Bruxism Among University Students: A Cross-Sectional Study

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ABSTRACT: Background: Bruxism, a repetitive masticatory muscle activity involving the clenching or grinding of teeth and/or bracing or thrusting of the mandible, is emerging as a relevant clinical and public health problem among young adults in higher education. University students are exposed to a distinct clustering of psychosocial stressors, circadian disturbances, and lifestyle factors, and this may increase their predisposition to awake bruxism (AB) and sleep bruxism (SB).

Aim: To estimate the prevalence of self-reported awake, sleep and combined bruxism for the general population and different bruxism subtypes among university students from various academic fields. To identify independent socio-demographic, psychological, sleep and behavioral predictors and comorbid symptomatology of temporo-mandibular disorder.

Methods: Of 569 participants (n = 640), 50.43% (n = 287) were females; mean age was 20 years. The percentages of probable bruxism were 26.78% (n = 117) and 17.49% (n = 63) in participants who reported and did not report certain TMD severity, respectively. The odds of probable bruxism were significantly higher in participants who reported

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certain TMD severity after adjusting for other variables (odds ratio 2.782; 95% confidence interval 1.463–5.291). The odds of probable bruxism were significantly higher in participants with certain TMD severity than in those who did not report the same (odds ratio 2.532; 95% confidence interval 1.278–5.032). Summary: TMD severity was statistically significantly associated with the likelihood of having probable bruxism in young adults.

Results The overall pooled prevalence of self-reported bruxism was 48.4% (n = 310; 95% confidence interval [CI] 44.5%-52.3%) with 24.1% (n=154) for isolated awake bruxism, 11.7% (n=75) for isolated sleep bruxism, and 12.7% (n=81) for combined bruxism. It was higher in females than in males (53.6% vs. 41.3%, p = 0.001) and in Health Sciences students than in Humanities students (54.8% vs. 39.5%, p = 0.004). On multivariable logistic regression analysis, high perceived stress (adjusted odds ratio [aOR] 3.89, 95% CI 2.15-7.04, p < 0.001), habitual nail or object biting (aOR 2.31, 95% CI 1.58-3.38, p < 0.001), and moderate-to-severe anxiety (aOR 2.18, 95% CI 1.49-3.19, p < 0.001), moderate perceived stress (aOR 2.14, 95% CI 1.35-3.39, p = 0.001), poor sleep quality (aOR 1.95, 95% CI 1.36-2.80, p < 0.001), daily caffeine intake greater than 300 mg (aOR 1.72, 95% CI 1.15-2.57, p = 0.008), enrollment in Health Sciences (aOR 1.64, 95% CI 1.06-2.54, p = 0.026), and female sex (aOR 1.52, 95% CI 1.05-2.20, p = 0.027) were independent predictors. Also, 41.3% of bruxers and 56.8% of combined bruxers had moderate-to-severe TMD symptoms, compared to 11.2% of nonbruxers (p < 0.001).

Conclusion: Almost one in two of the university students questioned had signs of symptoms that implied possible bruxism, with awake bruxism more than twice as prevalent as isolated sleep bruxism. Psychosocial distress, suboptimal sleep quality, undue consumption of coffee and para-function through oral behavior are major independent factors to consider. Institutional screening along with cognitive-behavioral stress management and sleep enhancement strategies can be all-embracing.

1. INTRODUCTION

1.1 Contemporary Conceptualization and Diagnostic Taxonomy of Bruxism

Bruxism: An in-depth Report

Bruxism is a term used to define repetitive jaw-muscle activities that involves clenching or grinding of teeth, as well as bracing or thrusting of the mandible (Bracci et al., 2023). Over the last decade, worldwide consensus among experts in the field has led to a paradigm shift that is drastically revising the conceptual framework of bruxism. The path concept is moving away from a peripheral-mechanistic doctrine that related parafunctional jaw activity solely to occlusal interferences or malocclusion to an integrated biopsychosocial and neurobiological approach (Walczyńska-Dragon et al., 2025). According to the recent diagnostic criteria, bruxism is no longer regarded as a disorder only in otherwise healthy individuals, but rather a centrally regulated motor behavior based on dopaminergic, noradrenergic, and serotonergic pathways in the basal ganglia and brainstem; thus, it may simply be a risk indicator for potentially negative effects on the stomatognathic apparatus or, in some cases, a protective physiological factor, such as preserving air-flow in the airway during sleep (Bracci et al., 2023; Zieliński et al., 2024).

Most importantly, bruxism exists as two different circadian phenotypes that are distinct based on their neurophysiological mechanisms, muscle contraction phenomenology, and clinical associations. SB is considered masticatory muscle activity during sleep and occurs in the form of phasic (rhythmic) or tonic (non-rhythmic) events (Zieliński et al., 2024). Not considered as a movement or sleep disorder within systemically healthy individuals, SB may be distinguished from AAB by its lack of an association with changes in arousal (Zieliński et al., 2024). AAB refers to masticatory muscle activity during wakefulness, characterized by repetitive or sustained tooth contact and/or the bracing or thrusting of the mandible, as seen during episodes of heightened cognitive concentration or emotional tension (Bracci et al., 2023).

As a result, international consensus for clinical and epidemiological research has proposed a three-level grading of diagnosis as follow: i) possible sleep or awake bruxism is distinguished by positive self-report with questionnaires or clinical history; ii) probable bruxism with positive clinical inspection (attachment facets, linea alba on the buccal mucosa, tongue indentations, and masseteric hypertrophy +/- positive self-report); and iii) definite bruxism with instrumental verification (PSG with audio-video recording for SB, EMG and EMA for AB). Instrumental recordings are considered the gold standard for small mechanistic laboratory studies, however validated questionnaires are currently the standard for large population epidemiology as a cheap, accessible approach capable of estimating the longitudinal experience of subjective awareness across many people (Bakri et al., 2024; Zieliński et al., 2024).

1.2 Global Epidemiology and Vulnerability of University Student Populations

A recent major systematic review and meta-analysis by Zieliński et al. (2024), analyzed epidemiological data from studies conducted worldwide in both pediatric and adult samples to estimate the prevalence of bruxism on a global scale to be 22.22%. Reported pooled prevalence in sleep and awake bruxism were 21% and 23% respectively. Yet, a detailed subgroup analysis of the study revealed a subgroup of young adult college students showed a much higher prevalence of parafunctional masticatory activity when compared with an adult sample in general (Alencar et al., 2023; De Oliveira et al., 2022). Among samples from various nations reported from 2020-2025, self reported prevalence of bruxism among university students varied from as low as 28.7% to 65%+, with variation probably attributable to academic major, cultural factors, stress/Examination time, and population sample (Alencar et al., 2023; Bakri et al., 2024; Kadıoğlu et al., 2025).

Transition between secondary school and university is an important time of development, accompanied by demands on psychological, social and environmental levels. University students experience ongoing academic pressure, high-stake examinations, increased academic workload, financial hardship, separation from family, absence of social support, and lack of clarity about their career choices post graduation (De Oliveira et al., 2022; Kadioglu et al., 2025). Students following demanding healthcare tracks of study, including dentistry, medicine, pharmacy and nursing, encounter additional stressors, characterized by early-stage patient-care clinical duties, high expectations of manual precision, and awareness of orofacial health symptoms (Bakri et al., 2024; Dias et al., 2022; Kadioglu et al., 2025). A cross-sectional study of dental students by Bakri et al. (2024) reported academic workload and demanding clinical timetable as significant risk factors for daytime clenching and night-time bruxism.

1.3 Psychosocial, Circadian, and Behavioral Pathways

The proposed neuroendocrine mechanism that explains the pathophysiological link between university psychosocial stress and bruxism could be mediated through neuroendocrine and autonomic hyperarousal. Chronic exposure to stress and anxiety activates the amygdala, HPA axis and locus coeruleus-noradrenergic system during ongoing stress (González González et al., 2025; Walczyńska-Dragon et al., 2025). Increased secretion of cortisol and catecholamine levels in the blood results in increased sympathetic tone and gamma-motoneurons excitability in the trigeminal motor nucleus, such that unresolved emotional arousal could be discharged somatically with tonic contraction of the masseter, temporalis and medial pterygoid muscles during waking (AB), and increased rhythmic activity of the masticatory muscles during sleep (SB) (Walczyńska-Dragon et al., 2025).

Furthermore, university lifestyles often interfere with circadian homeostasis and sleep architecture, with late-night study sessions, excessive evening screen time to blue-light emitting digital devices, irregular sleep-wake schedules, and chronic sleep deprivation impairing subjective and objective sleep quality (González González et al., 2025). Polysomnography confirms that SB attacks are predominantly associated with transient cortical and autonomic micro-arousals during light NREM sleep stages N1 and N2, often associated with pre-cortical and autonomic hyperarousal (cardiac sympathetic outflow and EEG arousal; Zieliński et al., 2024). Meanwhile, students are prone to sedentary stimulant consumption (e.g., a daily ration of >400 mg caffeine, caffeinated tea, energy drinks, and nicotine) and oral parafunctional behaviors (chewing on pencils and pens, onychophagia, chewing on cheeks, and gnawing on gum), which are partly modulated pharmacologically by caffeine antagonist action at central adenosine receptors A1/A2A (disinhibiting dopaminergic/noradrenergic neurotransmission, increasing dispersal of delta activity, and facilitating trigeminal motor units recruitment; 1, 2; Alencar et al., 2023).

1.4 Clinical implications and the rationale for this study

Repetitive and relentless bruxism imposes non-physiological forces on the teeth, periodontium, masticatory muscles, and TMJs that are presumed to be greater in magnitude and duration than functional mastication. Clinical consequences of continuing bruxism will become the real world therapeutic challenges of up to 4 dozen of the more common potential adverse side effects such as drab enamel and dentin attrition, cervical Abfraction lesions, generalized dentin sensitivity, catastrophic chipping and fracture of teeth and prosthetic restorations, benign massiteric hypertrophy, enduring headache throughout the day and painful TMDs (Bakri et al., 2024; Kadıoğlu et al., 2025). Interestingly, a meta-analysis study by Zieliński et al. (2024) showed a worldwide prevalence of bruxism in TMD of 17%; the effect of sex was the greatest upon being female and more likely to develop painful myofascial and intra-articular TMD.

Despite an increasing literature about bruxism in young adults, studies exhibited some methodological limitations. As the majority of studies only recruited students from one faculty, sample generalizability across the whole university milieu may be questionable (Bakri et al., 2024; Dias et al., 2022). Some studies have failed to separate isolated awake bruxism, isolated sleep bruxism, and circadian phenomena; other studies have focused on psychological stress and associated psychological factors in bivariate analysis, not accounting for sleep quality, caffeine intake, and oral behaviors as potential confounders in multivariable analysis (Alencar et al., 2023; González González et al., 2025). Building on this literature, the current cross-sectional study aimed to (1) establish overall and circadian-specific bruxism prevalence estimates within a large multidisciplinary sample of undergraduates, (2) determine predictive demographic, academic, psychological, sleep, and behavioral covariates of self-report bruxism using multivariable logistic regression, and (3) compare temporomandibular disorder symptom severity across bruxism phenotypes.

2. MATERIALS AND METHODS

2.1 Study Design, Setting, and Ethical Governance

An analytic, observational cross-sectional design was used for this research project over a six-month, academic year period from September 2024 through February 2025 for a cohort of full-time undergraduate students attending a regional, state major public university. For the purpose of methodological rigor and transparent epidemiological reporting, the study design and implementation was formatted according to the specific guidelines of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement. The research project received approval from the Institutional Review Board and University Research Ethics Committee before any subjects were recruited. Study protocol adhered to the World Medical Association Declaration of Helsinki. Electronic informed consent was obtained from all subjects with a formal agreement to participate prior to being granted access to the survey instrument, and no incentives or inducements were provided for any participant.

2.2 Sample Size Calculation and Inclusion/Exclusion Criteria

A priori sample size calculation was based on the Single Population Proportion formula for cross-sectional epidemiological surveys [$n = (Z2(1-\alpha/2) \times P(1-P)/d2$]. With reference to the previous epidemiological study (De Oliveira et al., 2022), which reported a prevalence (P) of SR bruxism as 45.8%; a confidence level of 95%; and an absolute precision (d) of 4.0% (0.04), the minimum sample size was calculated to be 596. With an added 10% for any loss of participants, visitors etc. when both the sample and the original population were expected to decrease, we planned to recruit 660 undergraduate students.

Participants The study included eligible participants who (a) were actively attending classes full-time towards a bachelor's degree in the year 2024-2025, (b) were aged 18-26 years on the basis of the year of birth, and (c) signed consent to participate in the research. Exclusion criteria included suspected secondary or iatrogenic causes of masticatory muscle activity (a) trauma of the maxillofacial region, a mandibular fracture or orthognathic surgery during the past 12 months; (b) treatment with a fixed appliance or clear aligners at the time of the study, as the active orthodontic treatment causes transient occlusal discomfort associated with abnormal clenching; (c) neurologic, neurodegenerative or primary sleep movement disorders (epilepsy, dystonia, obstructive sleep apnea, etc); (d) clinical use of selective serotonin reuptake inhibitors (SSRI), serotonin-norepinephrine reuptake inhibitors (SNRI), antipsychotics, dopamine agonists or stimulants, which induce medication-related bruxism; (e) questionnaires were not filled out in full.

2.3 Sampling Strategy and Data Collection Protocol

A stratified (by discipline and year) two-stage sampling method was applied for a total of 2,955 students: Stage 1-Split students into three majors: Health Science (Medicine, Dentistry, Pharmacy and Nursing), (Engineering and Applied Science (Civil, Mechanical, Electrical, and Computer Engineering), and (Huma nities and Social Science (Law, Economics, Psychology, and Literature) as well as two-year periods (Juniors: Year 1 and 2; Seniors: Year 3 and 4). Stage 2-Using computer-generated random numbers, students and their roll call numbers from compulsory core lectures in each stratum were randomly selected.

Trained research assistants approached randomly selected lecture sites and invited students to take the survey during designated intermission periods, avoiding the 48 hours immediately before midterm or final examinations to prevent surges in situational testing effects from skewing baseline estimates. Students received a standard verbal script outlining the research purpose and confidentiality terms, then used smartphone or personal computer to follow a QR code link to an institutional-hosted encrypted digital survey, which employed a single browser-level submission token that did not record user IP address or metadata. Out of 685 students invited, 658 consented (initial n = 658, initial response rate = 96.1%).18 Of these, 18 were subsequently excluded per predefined criteria-active orthodontic treatment (n = 11), current SSRI medication treatment (n = 4), incomplete responses (n = 3)-leaving 640 (final n = 640, final valid response rate = 93.4%).

2.4 Survey Instrument and Operational Variable Definitions

Questionnaire Data were gathered from a structured six-domain self-administered questionnaire derived from internationally validated psychometric and dental screening questionnaires.

1. The variables for this domain were biological sex (female/male), age (classified as 18-20, 21-23, or 24-26 years), academic faculty, academic year (Junior Year 1-2 vs Senior Year 3-4), self-report of cumulative Grade Point Average (GPA on a 4.00 scale; classified as low (< 2.50), moderate (2.50-3.49), and high (3.50), self-report of living situation (at home with family, dormitory in the university, or apartment off-campus with other students), and self-report of socioeconomic family status (low, middle, high).

2. In accordance with international diagnostic consensus guidelines for 'possible' (subject-based) bruxism (Bracci et al., 2023; Kadıoğlu et al., 2025), participants completed validated screening questions adapted from the American Academy of Sleep Medicine (AASM) diagnostic criteria for sleep bruxism (SB) and the Oral Behaviors Checklist (OBC; Dias et al., 2022). SB was operationalized as being aware of or being told by a roommate, family member, or bed partner that the participant ground or clenched their teeth audibly in their sleep at least once a week in the last three months and experiencing one or more typical morning symptoms of grinding/clenching (e.g., transient masticatory muscle fatigue or stiffness, jaw locking, or temporal headache). Awake bruxism (AB) was operationalized as being aware of grinding, clenching, or maintaining teeth in contact under non-functional conditions or bracing and thrusting the mandible while awake (e.g., during studying, listening to lectures, computer use) reported as occurring 'sometimes,' 'often,' or 'always.' Based on these responses, participants were assigned to four mutually exclusive bruxism phenotypes: Non-Bruxism, Isolated Awake Bruxism (AB only), Isolated Sleep Bruxism (SB only), and Combined Bruxism (AB and SB). For binary logistic regression analyses, those with AB, SB or Combined Bruxism were combined into a single Overall Bruxism group.

3. Psychological distress was measured using the 10-item version of the Perceived Stress Scale (PSS-10), a measure of how uncontrollable, unpredictable and overloaded the respondents perceive life to have been over the last month (items scored 0 to 4; summed to total scores of 0-40). In accordance with the established clinical cut-offs (Bakri et al., 2024), scores were categorized as low (0 to 13), moderate (14 to 26) and high (27 to 40) perceived stress. Internal consistency was excellent within the current sample ($\alpha = 0.87$). Symptoms of anxiety and depression were measured using the 14-item Hospital Anxiety and Depression Scale (HADS), a 7-item subscale for each phenomenon (HADS-A and HADS-D), with two items devoted to anxiety and depression respectively (scores 0 to 21; cut-off score ≥ 11 of the HADS-A or the HADS-D indicated a moderate-to-severe, clinically relevant symptomatology; Cronbach's $\alpha = 0.84$ and 0.81 respectively).

4. Subjective sleep quality (PSQI) – the 19-items Pittsburgh Sleep Quality Index (PSQI) was used to assess subjective sleep quality and sleep disturbances during the past month (Yousef et al., 2022). Seven component scores (sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping medication, and daytime dysfunction) were summed to yield one global score (ranging from 0–21). Based on the previous research reporting a cutoff for poor sleep

quality based on the total score of the PSQI questionnaire (González González et al., 2025), a cutoff of the global score greater than 5 was used for poor sleep quality (Cronbach's $\alpha = 0.79$).

5. Lifestyle Behaviors, Stimulants, and Oral Para functional Behaviors: Past and current tobacco smoking status (current smoker vs. non-smoker), regular alcohol use (≤ 1 drink/week vs. non-drinker/rare), recreational digital screen time (dichotomized as < 4 hours/day vs. ≥ 4 hours/day), and caffeine intake (standardized servings equivalents of brewed coffee (roughly 95 mg caffeine), espresso (roughly 65 mg), black/green tea (roughly 45 mg), and caffeinated energy drinks (roughly 80-160 mg) converted from manufacturer information and doses from dried beans-roughly 300 mg/day vs. > 300 mg/day) were ascertained by single items (Alencar et al., 2023). Oral parafunctional behaviors were examined by simple dichotomous items that measured nail biting (onychophagia), biting a pen, pencil, or foreign object, chewing gum for > 30 minutes daily, and habitual biting of the buccal or labial mucosa.

6. The presence and severity of TMD symptoms were determined via the Fonseca Anamnestic Index (FAI); a validated 10-item self-report screening questionnaire inquiring about jaw pain, neck stiffness, headache, pain in mastication, temporomandibular joint clicking, mouth opening limitation, perceived malocclusion, and emotional tension (Kadıoğlu et al., 2025). Each question was scored on a 3-point scale ('yes'=10, 'sometimes'=5, and 'no'=0), with possible total scores from 0 to 100; the absence of TMD (0–15), mild TMD (20–40), moderate TMD (45–65), and severe TMD (70–100) can be defined with Cronbach's $\alpha = 0.83$.

2.5 Statistical Analysis Plan

Statistical analysis was performed using the IBM SPSS Statistics for Windows, version 29.0 (IBM Corp., Armonk, NY, USA). Distribution of continuous variables was checked by means of the Kolmogorov-Smirnov test, skewness/kurtosis parameters and visual evaluation of Q-Q plots. Categorical variables were expressed as absolute and relative frequencies (n, %), while continuous variables as means ± standard deviations (Mean ± SD) or medians and interquartile ranges (median, IQR).

Bivariate relationships between categorical independent variables and overall bruxism category (non-bruxism, bruxism 4 group classings) were analysed with Pearson's χ 2 (chi-square; χ 2), Fisher's exact test, and odds ratios (OR; 95% CI) with 2-tailed significance. For comparing continuous psychometric and clinical scores between the four mutually exclusive bruxism sub-groups, a 1-way analysis of variance (ANOVA) was used for PSS-10, HADS-A, HADS-D, and PSQI scores with normal data distribution; and the Kruskal-Wallis H test for non-normal data; i.e. FAI scores followed by χ 2 -test Bonferroni-Hochberg corrected pairwise post-hoc tests.

To identify the independent predictors of self-reported bruxism while controlling for potential multicollinearity and confounding within the psychological and behavioral covariates, all covariates associated with self-reported bruxism at $p < 0.15$ using bivariate analysis were included in a multivariable binary logistic regression model using backward stepwise (likelihood ratio) entry method. Prior to modeling, the tolerance and variance inflation factors (VIF) were examined for all covariates to confirm there was no evidence of severe multicollinearity (all tolerance > 0.2; all VIF < 2.2). Hosmer-Lemeshow statistic was used to assess model calibration and goodness-of-fit (all $p > 0.05$), while pseudo-R2 (Nagelkerke) was used to estimate model variation explained. Adjusted odds ratios (aOR) with 95% confidence interval (CI) are reported, with significance level set at $p < 0.05$ (two-tailed).

3. RESULTS

3.1 Characteristics of the Participants and Total Frequency of Bruxism

The final analytic sample consisted of 640 undergraduate university students (371 females; 58.0% and 269 males; 42.0%), with an age of 21.2 ± 1.9 years (Median: 21 years; 18–26 years). The facultys of the students were represented by 241 students (37.7%) in Health Sciences, 214 students (33.4%) in Engineering and Applied Sciences and 185 students (28.9%) in Humanities and Social Sciences. Almost half of the students (Years 3–4) were in their final years of study (n = 311; 48.6%), while 53.4% (n = 342) of students were living with their families.

Composite results in table 2 indicated that, overall, 310 of 640 students identified one or more circadian manifestations of bruxism, yielding a cumulative prevalence of 48.4% (95% CI: 44.5%-52.3%). The prevalence per mutually exclusive circadian phenotyping indicated that isolated AB was the most prevalent event (24.1%; n = 154), more than twice as common as

isolated SB (11.7%; n = 75), and approximately equal to combined bruxism (12.7%; n = 81). If all overlapping circadian phenotypes were combined, the cumulative prevalence of awake bruxism (all students with isolated AB plus all students with combined bruxism) was 36.7% (n = 235), and the cumulative prevalence of sleep bruxism (all students with isolated SB plus all students with combined bruxism) was 24.4% (n = 156).

As shown in Table 1, chi-square (χ 2) bivariate analysis of sociodemographic and academic variables, revealed a statistically significant relationship with biological sex (χ 2 = 10.18, p = 0.001) where substantially more female students self-reported bruxism than male students (53.6% (268/530) vs. 41.3% (212/514)). There was also a significant difference between students' academic faculty and bruxism (χ 2 = 10.94, p = 0.004): university students in the Health Sciences faculty had the greatest prevalence (54.8% (132/241)), followed by students in the faculty of Engineering and Applied Sciences (47.7% (102/214)) and the Humanities and Social Sciences (39.5% (73/185)). There was a borderline significant difference in prevalence between senior undergraduate students (Years 3-4; 52.4% (185/353)) and junior students (Years 1-2; 44.7% (213/476); χ 2 = 3.84, p = 0.050), but no significant difference between the two groups in average chronological age (p = 0.377), living arrangement (p = 0.389), socioeconomic status (p = 0.538), or cumulative academic GPA tier (p = 0.348).

Table 1. Sociodemographic and academic characteristics of university students stratified by self-reported bruxism status (N = 640).

Variable	Category	Total Sample (N = 640) n (%)	Non-Bruxism (n = 330) n (%)	Overall Bruxism (n = 310) n (%)	χ^2 Value	p-Value
Biological Sex	Female	371 (58.0%)	172 (46.4%)	199 (53.6%)	10.18	**0.001***
	Male	269 (42.0%)	158 (58.7%)	111 (41.3%)		
Age Group (Years)	18–20	258 (40.3%)	141 (54.7%)	117 (45.3%)	1.95	0.377
	21–23	296 (46.3%)	148 (50.0%)	148 (50.0%)		
	24–26	86 (13.4%)	41 (47.7%)	45 (52.3%)		
Academic Faculty	Health Sciences	241 (37.7%)	109 (45.2%)	132 (54.8%)	10.94	**0.004***
	Engineering & Sciences	214 (33.4%)	112 (52.3%)	102 (47.7%)		
	Humanities & Social Sci.	185 (28.9%)	112 (60.5%)	73 (39.5%)		
Year of Study	Junior (Years 1–2)	329 (51.4%)	182 (55.3%)	147 (44.7%)	3.84	**0.050***
	Senior (Years 3–4)	311 (48.6%)	148 (47.6%)	163 (52.4%)		
Living Arrangement	With Family	342 (53.4%)	184 (53.8%)	158 (46.2%)	1.89	0.389
	University Dormitory	189 (29.5%)	91 (48.1%)	98 (51.9%)		
	Shared Off-Campus	109 (17.0%)	55 (50.5%)	54 (49.5%)		

Variable	Category	Total Sample (N = 640) n (%)	Non-Bruxism (n = 330) n (%)	Overall Bruxism (n = 310) n (%)	χ^2 Value	p-Value
Socioeconomic Status	Low	118 (18.4%)	56 (47.5%)	62 (52.5%)	1.24	0.538
	Middle	412 (64.4%)	215 (52.2%)	197 (47.8%)		
	High	110 (17.2%)	59 (53.6%)	51 (46.4%)		
Academic GPA	Low (< 2.50 / 4.00)	84 (13.1%)	39 (46.4%)	45 (53.6%)	2.11	0.348
	Moderate (2.50–3.49)	368 (57.5%)	198 (53.8%)	170 (46.2%)		
	High (≥ 3.50 / 4.00)	188 (29.4%)	93 (49.5%)	95 (50.5%)		

*Column percentages are reported for the Total Sample; row percentages are reported for Non-Bruxism and Overall Bruxism to illustrate group prevalence. *Statistically significant at $p \leq 0.05$ (Pearson's Chi-square test).*

3.2 Disaggregation of Circadian Bruxism Phenotypes by Faculty and Sex

Stratifying the cohort into the four mutually exclusive circadian phenotypes revealed marked heterogeneity across academic faculties and biological sex (Figure 1). Among Health Sciences students, isolated AB affected 26.6% (n = 64), isolated SB affected 11.6% (n = 28), and combined bruxism reached 16.6% (n = 40)—more than double the prevalence of combined bruxism observed in Humanities students (7.6%, n = 14; $\chi^2 = 15.82$, p = 0.015). Similarly, female students demonstrated substantially higher rates of isolated AB (26.4% vs. 20.8% in males) and combined bruxism (15.1% vs. 9.3% in males), whereas isolated SB prevalence was comparable between sexes (12.1% in females vs. 11.2% in males).

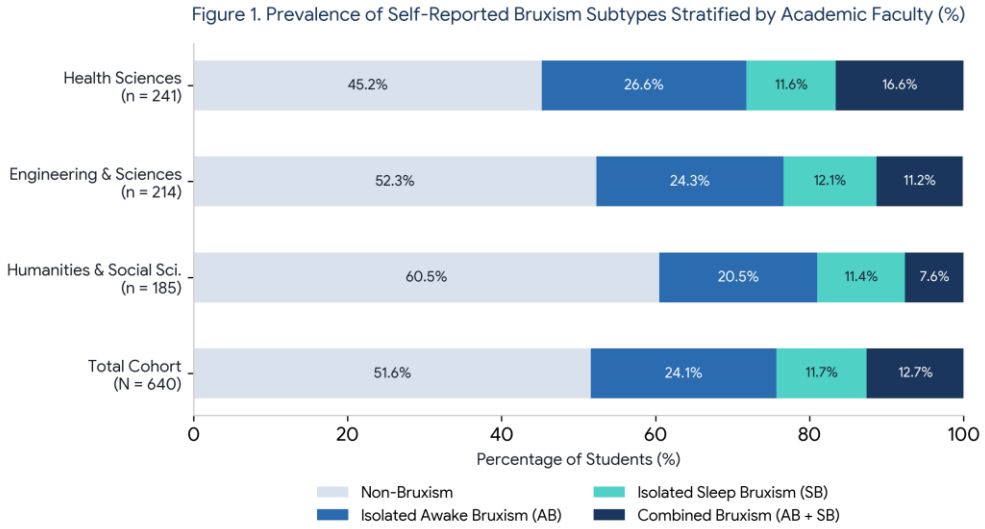


Figure 1. Horizontal stacked bar chart illustrating the distribution of mutually exclusive self-reported bruxism phenotypes (Non-Bruxism, Isolated Awake Bruxism [AB], Isolated Sleep Bruxism [SB], and Combined Bruxism [AB + SB]) stratified by academic faculty (N = 640).

3.3 Psychological Distress, Sleep Quality, and TMD Severity Across Subtypes

One-way ANOVA and Kruskal-Wallis analysis on continuous variables of psychometric and somatic symptoms scores across the four categories of bruxism demonstrated, statistically significant, clear stepwise gradients in each of the clinical parameters

measured (all $p < 0.001$; Table 2). Subjects in the Combined Bruxism group reported the greatest clinical severity, as evidenced by the highest scores for perceived stress (PSS-10 = 24.8 ± 5.9 vs. 16.4 ± 5.8 non-bruxers; $F = 62.41$, $p < 0.001$), anxiety (HADS-A = 11.9 ± 3.8 vs. 6.8 ± 3.5, $F = 58.19$, $p < 0.001$), depression (HADS-D = 8.7 ± 3.6 vs. 5.4 ± 3.1; $F = 27.84$, $p < 0.001$), sleep disturbance (PSQI = 8.9 ± 3.1 vs. 5.2 ± 2.6, $F = 48.92$, $p < 0.001$), and TMJ severity (FAI = 48.6 ± 18.4 vs. 18.5 ± 14.2, $H = 142.6$, $p < 0.001$).

Bonferroni post-hoc pairwise comparisons revealed disparate phenotype-specific profiles: on perceived stress and anxiety, both Isolated AB and Isolated SB scored significantly higher than Non-Bruxism controls ($p < 0.001$), while the Combined Bruxism group scored significantly higher than all other groups ($p < 0.01$); on the Pittsburgh Sleep Quality Index (PSQI), students with Isolated SB (7.8 ± 2.9) and Combined Bruxism (8.9 ± 3.1) scored significantly worse than both Non-Bruxers (5.2 ± 2.6) and Isolated AB (6.7 ± 2.8) ($p < 0.01$), implying an especially tight coupling between sleep disruption and nocturnal grinding.

Clinically significant moderate-to-severe TMD symptoms (FAI score 45) were present in 41.3% (128/310) of students with any form of bruxism, amounting to a nearly fourfold increase in prevalence compared with non-bruxers (11.2%, 37/330; $\chi 2 = 75.82$, $p < 0.001$). As can be seen in figure 3, prevalence of moderate-to-severe TMD increased dramatically through the phenotypes, reaching 35.1% (54/154) in the students with Isolated AB, 37.3% (28/75) in those with Isolated SB, and 56.8% (46/81) in those with Combined Bruxism ($\chi 2 = 86.4$, $p < 0.001$).

Table 2. Comparison of psychological distress, subjective sleep quality, and temporomandibular disorder (TMD) scores across bruxism subtypes (N = 640).

Psychometric / Clinical Instrument	Non-Bruxism (n = 330) Mean ± SD	Isolated AB (n = 154) Mean ± SD	Isolated SB (n = 75) Mean ± SD	Combined AB+SB (n = 81) Mean ± SD	Test Statistic (F / H / χ^2)	p-Value
Perceived Stress Scale (PSS-10)	16.4 ± 5.8[a]	21.9 ± 5.6[b]	20.1 ± 6.0[b]	24.8 ± 5.9[c]	F = 62.41	**< 0.001***
HADS Anxiety Subscale (HADS-A)	6.8 ± 3.5[a]	10.2 ± 3.7[b]	9.4 ± 3.6[b]	11.9 ± 3.8[c]	F = 58.19	**< 0.001***
HADS Depression Subscale (HADS-D)	5.4 ± 3.1[a]	7.3 ± 3.4[b]	7.1 ± 3.5[b]	8.7 ± 3.6[c]	F = 27.84	**< 0.001***
Global Sleep Quality (PSQI)	5.2 ± 2.6[a]	6.7 ± 2.8[b]	7.8 ± 2.9[c]	8.9 ± 3.1[c]	F = 48.92	**< 0.001***
TMD Severity Score (FAI Total)	18.5 ± 14.2[a]	34.2 ± 17.6[b]	36.8 ± 18.1[b]	48.6 ± 18.4[c]	H = 142.60	**< 0.001***
Moderate–Severe TMD (FAI ≥ 45), n (%)	37 (11.2%)	54 (35.1%)	28 (37.3%)	46 (56.8%)	$\chi^2 = 86.40$	**< 0.001***

*Different superscript letters (a, b, c) within the same row denote statistically significant pairwise differences ($p < 0.05$) following Bonferroni post-hoc correction. AB = Awake Bruxism; SB = Sleep Bruxism; FAI = Fonseca Anamnestic Index. *Statistically significant at $p < 0.001$.*

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Figure 3. Burden of Temporomandibular Disorder (TMD) Symptoms Across Bruxism Subtypes

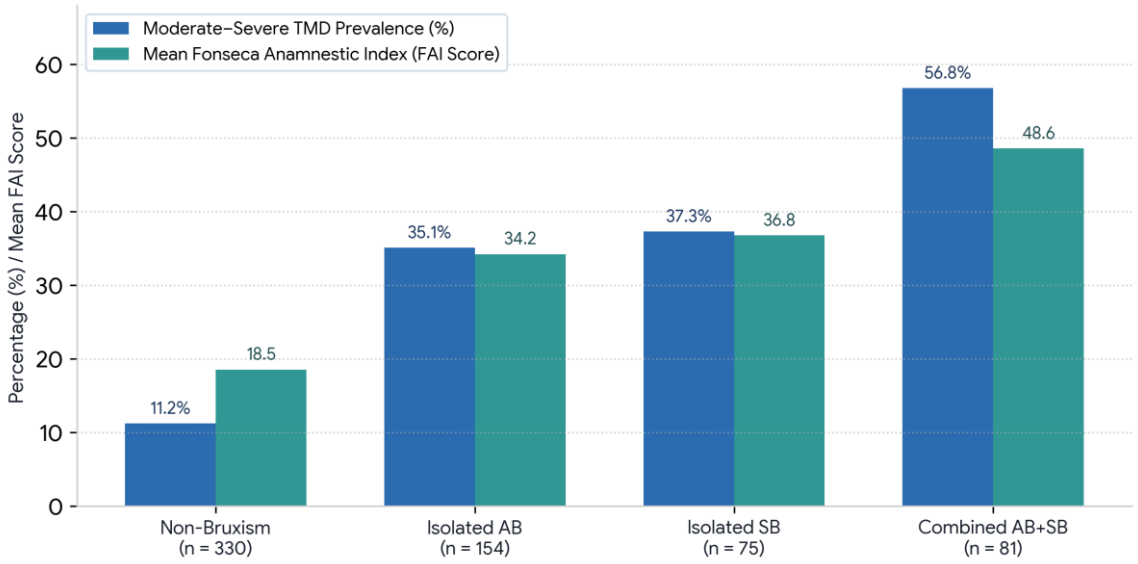


Figure 3. Prevalence of clinically relevant moderate-to-severe temporomandibular disorder symptoms (FAI ≥ 45) and mean Fonseca Anamnestic Index (FAI) scores across self-reported bruxism phenotypes (N = 640).

3.4 Bivariate Associations with Psychological Categories, Stimulants, and Oral Habits

Table 3 displays the bivariate relationships between categorical psychometric thresholds, lifestyle behaviors, oral parafunctional habits, and global self-reported bruxism. Compared with students with low perceived stress (PSS-10 0-13), students with moderate perceived stress (PSS-10 14-26) had bruxism with over three times the odds (OR = 3.46, 95% CI 2.27-5.27), and students with high perceived stress (PSS-10 27-40) had bruxism with over eight times the odds (OR = 8.07,

Table 3. Bivariate associations of psychological categories, sleep quality, stimulant intake, and oral para-functional habits with self-reported bruxism (N = 640).

Independent Variable	Category	Non-Bruxism (n = 330) n (%)	Overall Bruxism (n = 310) n (%)	Crude OR (95% CI)	χ^2 Value	p-Value
Perceived Stress (PSS-10)	Low (0–13)	124 (37.6%)	38 (12.3%)	1.00 (Ref)	68.45	**< 0.001***
	Moderate (14–26)	168 (50.9%)	178 (57.4%)	3.46 (2.27–5.27)		
	High (27–40)	38 (11.5%)	94 (30.3%)	8.07 (4.76–13.69)		
Anxiety Symptoms (HADS-A)	Normal/Mild (< 11)	262 (79.4%)	164 (52.9%)	1.00 (Ref)	50.32	**< 0.001***
	Moderate–Severe (≥ 11)	68 (20.6%)	146 (47.1%)	3.43 (2.42–4.87)		
Depression Symptoms (HADS-D)	Normal/Mild (< 11)	291 (88.2%)	233 (75.2%)	1.00 (Ref)	18.25	**< 0.001***

Independent Variable	Category	Non-Bruxism (n = 330) n (%)	Overall Bruxism (n = 310) n (%)	Crude OR (95% CI)	χ^2 Value	p-Value
	Moderate–Severe (≥ 11)	39 (11.8%)	77 (24.8%)	2.47 (1.62–3.76)		
Sleep Quality (PSQI)	Good (≤ 5)	204 (61.8%)	112 (36.1%)	1.00 (Ref)	42.26	**< 0.001***
	Poor (> 5)	126 (38.2%)	198 (63.9%)	2.86 (2.08–3.94)		
Daily Caffeine Intake	≤ 300 mg/day	252 (76.4%)	180 (58.1%)	1.00 (Ref)	24.42	**< 0.001***
	> 300 mg/day	78 (23.6%)	130 (41.9%)	2.33 (1.66–3.28)		
Tobacco Smoking	Non-Smoker	278 (84.2%)	231 (74.5%)	1.00 (Ref)	9.28	**0.002***
	Current Smoker	52 (15.8%)	79 (25.5%)	1.83 (1.24–2.70)		
Alcohol Consumption	Non-Drinker / Rare	269 (81.5%)	240 (77.4%)	1.00 (Ref)	1.54	0.214
	Regular (≥ 1/week)	61 (18.5%)	70 (22.6%)	1.29 (0.87–1.89)		
Daily Screen Time	< 4 hours/day	149 (45.2%)	97 (31.3%)	1.00 (Ref)	12.98	**< 0.001***
	≥ 4 hours/day	181 (54.8%)	213 (68.7%)	1.81 (1.31–2.50)		
Nail / Object Biting	No	249 (75.5%)	157 (50.6%)	1.00 (Ref)	42.54	**< 0.001***
	Yes	81 (24.5%)	153 (49.4%)	3.00 (2.14–4.20)		
Frequent Gum Chewing	No (≤ 30 min/day)	264 (80.0%)	204 (65.8%)	1.00 (Ref)	16.34	**< 0.001***
	Yes (> 30 min/day)	66 (20.0%)	106 (34.2%)	2.08 (1.45–2.97)		
Cheek / Lip Biting	No	275 (83.3%)	209 (67.4%)	1.00 (Ref)	21.95	**< 0.001***
	Yes	55 (16.7%)	101 (32.6%)	2.42 (1.66–3.52)		

*Column percentages are displayed within Non-Bruxism and Overall Bruxism columns. OR = Crude Odds Ratio; CI = Confidence Interval; Ref = Reference category. *Statistically significant at $p < 0.05$.*

3.5 Multivariable Logistic Regression of Independent Predictors

To identify independent predictors and to partial out the effects of possible collinearities amongst the psychological, sleep and lifestyle covariates, a binary logistic regression analysis was employed, as depicted in Table 4 and Figure 2. This omnibus test was statistically significant ($\chi2 = 178.42$, df = 12, $p < 0.001$), and indicated good calibration of the model using the Hosmer-

Lemeshow goodness-of-fit ($\chi 2$ = 6.14, df = 8, p = 0.632). The total prediction success of the model was 73.8%, and it explained 32.6% (Nagelkerke R2) of the variance in self-reported bruxism.

After adjustment for all of the covariates at the same time, 7 individual factors remained positively and statistically significantly associated with self-reported bruxism. The first factor is perception of high stress (PSS-10 27: aOR=3.89, 95% CI: 2.15-7.04, p<0.001) with a significant dose-response effect observed for PSS 14-26 (aOR=2.14, 95% CI: 1.35-3.39, p=0.001). The second factor was nail or object biting (aOR=2.31, 95% CI: 1.58-3.38, p<0.001). The third was moderate-to-severe anxiety symptoms (HADS-A 11; aOR=2.18, 95% CI: 1.49-3.19, p<0.001). The fourth was poor subjective sleep quality (PSQI > 5; aOR=1.95, 95% CI: 1.36-2.80, p<0.001). The fifth was high daily caffeine (>300 mg/day; aOR=1.72, 95% CI: 1.15-2.57, p=0.008). The sixth was enrolled in Health Sciences versus Humanities (aOR=1.64, 95% CI: 1.06-2.54, p=0.026). The seventh was female sex (aOR=1.52, 95% CI: 1.05-2.20, p=0.027). Moderate-to-severe depression (HADS-D 11; p=0.338), current tobacco smoking (p=0.145), and biting of lips/cheeks (p=0.069) were unable to demonstrate significant association after adjustment for perceived stress, anxiety, and sleep quality.

Table 4. Multivariable binary logistic regression model identifying independent predictors of self-reported bruxism among university students (N = 640).

Independent Predictor	Reference Category	β Coeff.	SE	Adjusted OR (aOR)	95% Confidence Interval (CI)	Wald χ^2	p-Value
Female Sex	Male Sex	0.419	0.189	**1.52**	1.05 – 2.20	4.91	**0.027***
Health Sciences Faculty	Humanities Faculty	0.495	0.223	**1.64**	1.06 – 2.54	4.93	**0.026***
Engineering Faculty	Humanities Faculty	0.278	0.226	1.32	0.85 – 2.06	1.51	0.219
Moderate Stress (PSS-10: 14–26)	Low Stress (0–13)	0.761	0.235	**2.14**	1.35 – 3.39	10.48	**0.001***
High Stress (PSS-10: 27–40)	Low Stress (0–13)	1.358	0.303	**3.89**	2.15 – 7.04	20.09	**< 0.001***
Moderate–Severe Anxiety (≥ 11)	Normal/Mild (< 11)	0.779	0.194	**2.18**	1.49 – 3.19	16.12	**< 0.001***
Moderate–Severe Depression (≥ 11)	Normal/Mild (< 11)	0.231	0.241	1.26	0.79 – 2.02	0.92	0.338
Poor Sleep Quality (PSQI > 5)	Good Sleep (≤ 5)	0.668	0.184	**1.95**	1.36 – 2.80	13.18	**< 0.001***
Caffeine Intake > 300 mg/day	≤ 300 mg/day	0.542	0.205	**1.72**	1.15 – 2.57	6.99	**0.008***
Current Tobacco Smoker	Non-Smoker	0.322	0.221	1.38	0.89 – 2.13	2.12	0.145
Habitual Nail / Object Biting	No Habit	0.837	0.194	**2.31**	1.58 – 3.38	18.61	**< 0.001***
Cheek / Lip Biting	No Habit	0.385	0.212	1.47	0.97 – 2.23	3.30	0.069

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*Model fit statistics: Omnibus $\chi^2 = 178.42$ ($df = 12$, $p < 0.001$); Nagelkerke $R^2 = 0.326$; Hosmer–Lemeshow goodness-of-fit $\chi^2 = 6.14$ ($p = 0.632$). SE = Standard Error; aOR = Adjusted Odds Ratio; CI = Confidence Interval. *Statistically significant at $p < 0.05$.*

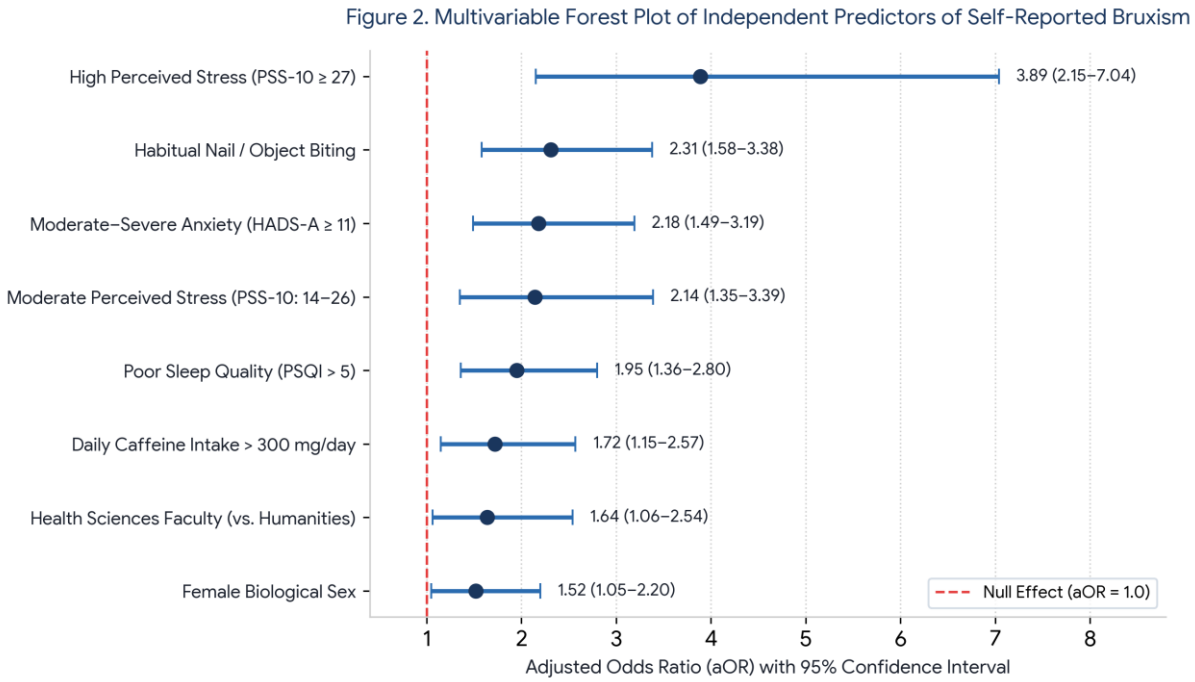


Figure 2. Multivariable forest plot displaying adjusted odds ratios (aOR) and 95% confidence intervals (CI) for statistically significant independent predictors of self-reported bruxism among university students (N = 640).

4. DISCUSSION

4.1 Synthesis of Principal Findings and Epidemiological Context

This cross-sectional study recorded the prevalence, circadian types and biopsychosocial features of self-report bruxers from a multidisciplinary sample of 640 university undergraduates. The headline – 48.4% of students surveyed report symptoms of possible bruxism – substantiates that university undergraduates form a high-risk group for this disorder, which constitutes more than twice the calculated global general adult prevalence of 22.22% (Zieliński et al., 2024). Furthermore, the aggregated prevalence in the current study is consistent with recent university samples worldwide, such as Brazilian undergraduates (De Oliveira et al., 2022), who found a prevalence of 45.8%, and Saudi dental undergraduates (Bakri et al., 2024), which falls within the range encountered in European and Middle Eastern tertiary education providers (Dias et al., 2022; Kadıoğlu et al., 2025).

4.2 Difference of Phenotype Between Awake Bruxism and Sleep Bruxism

A key strength of this research lies in the explicit distinction of bruxism into mutually exclusive circadian phenotypes. Isolated awake bruxism (24.1%) occurred over twice as frequently as isolated sleep bruxism (11.7%) when it was examined separately. Overall, 12.7% students had simultaneous daytime and nocturnal symptoms. The skew towards waking masticatory muscle activity is consistent with the recent report by Alencar et al. (2023) of 28.7% awake bruxism and 7.0% sleep bruxism in college students. Likewise, the work of Dias et al. (2022) illustrate how academic stress and behavioural disruption primarily magnify daytime tooth clenching and mandibular bracing, in contrast to nocturnal grinding.

These findings lend themselves to two interactive explanations for this circadian dichotomy. First, awake bruxism (Bracci et al., 2023) can be neurobehaviourally defined by a pattern of sustained jaw-closing muscle contraction of a relatively low magnitude, but due to the density of temporomandibular joints and postures that can be maintained with minimal muscle activity, causes mechanical stress and pain to a magnitude comparable to grinding. As a conscious phenomenon, one would expect higher interoception of daytime tooth contact, especially with masseteric tension, than of nocturnal chewing episodes

that are often unaware except upon becoming wakeful and likely can be attributed to a roommate and/or morning jaw pain (Kadıoğlu et al., 2025). Secondly, the 12.7% proportion of students with combined awake and sleep bruxism is an especially sensitive clinical population – having the highest means for all psychological, sleep, and pain variables, including 56.8% with moderate-severe TMD, which aligns with the biopsychosocial model of overlapped daytime and nocturnal parafunction described by Walczyńska-Dragon et al. (2025), whereby chronically-overlapped daytime and nighttime parafunction would augment mechanical demand on the stomatognathic system without sufficient recovery time.

4.3 Role of Biological Sex, Academic Discipline, and Academic Performance

Sex of participant emerged as an independent predictor of self-reported bruxism in the multivariable model (aOR 1.52, p = 0.027), with this driven by a higher prevalence of isolated awake and combined bruxism. The female preponderance in this sample is very consistent with contemporary epidemiological findings in university populations (Bakri et al., 2024; González González et al., 2025; Kadıoğlu et al., 2025) and meta-analytical analyses internationally (Zieliński et al., 2024). Neurobiological and psychosocial mechanisms that could account for this sex difference include sex-dependent responsiveness of the hypothalamic-pituitary-adrenal (HPA) axis to psychosocial stress, gonadally-driven properties of trigeminal nociceptive and motor pathways (González González et al., 2025), female students being more perceptive to somatic symptoms, and reporting more internalizing mood disorders and orofacial pain and discomfort (González González et al., 2025).

Academic major was independently predictive; students in Health Sciences faculties had a 64% greater adjusted odds of bruxism than Humanities and Social Sciences students (aOR=1.64, p=0.026), and senior students (Years 3-4) were more likely than the lower years. The demanding epistemologies and clinical obligations of health sciences education-particularly dentistry and medicine-are characterized by intense preclinical training, early participatory patient care, and onerous pressure to excel (Bakri et al., 2024; Kadıoğlu et al., 2025). However, curiously, self-reported GPA did not correlate significantly with bruxism (p=0.348), echoing Bakri et al.'s (2024) findings of an inconsequential negative relationship (r=0.034) between GPA and self-report of parafunction in dental students. This indicates that subjective internal stress recognition and perfectionism drive jaw-clenching as opposed to academic performance.

4.4 Psychosocial Stress as the Fundamental Brain-Based Trigger

Analyzing the multivariate regression model, high perceived stress (PSS-10 of 27; aOR=3.89) and moderate-to-severe anxiety (HADS-A of 11; aOR=2.18) were the strongest independent predictors of self-report bruxism with a well-established dose-response gradient across the different tiers of stress severity. All of these corroborate the validity of the central nervous system paradigm of bruxism etiology (Walczyńska-Dragon et al., 2025). Chronic psychosocial stress and excessive anxious hyperarousal will selectively activate limbic-hypothalamic circuitry and increase the central noradrenergic and dopaminergic tone, leading to an increased baseline fusimotor output toward the muscle spindles of the masseter and temporalis muscles (González González et al., 2025). During wakefulness, this will appear as persistent mandibular bracing and tooth clenching, while during sleep it will result in a lowered threshold for autonomic micro-arousals and chewing muscle rhythmic contractions (Zieliński et al., 2024). Notably, although depressed symptoms (HADS-D of 11) rose in bivariate analysis (OR=2.47), once adjusted for stress and anxiety, they no longer retained independent predictor status (aOR=1.26, p=0.338); this suggests that anxious hyperarousal and feelings of overload, but not anhedonic depressed symptoms, constitute the proximal psychophysiological stressors for masticatory hyperactivity.

4.5 Disruption of Sleep Architecture, Caffeine Consumption, and Oral Habits

Poor subjective sleep quality (i.e. PSQI > 5) increased self-report bruxism prevalence 2-fold independently (aOR = 1.95, p < 0.001), with global PSQI scores highest in Isolated SB and Combined SB groups. Along with pupil size differences, irregular sleep-wake rhythms, and academic late-night cram sessions and use of digital screens, sleep architecture disruption and transient cortical micro-arousals during NREM sleep are likely to be increased in college students with elevated SB indices, and are coupled in time-course with SB episodes (González González et al., 2025; Zieliński et al., 2024). Also, daily caffeine intake > 300 mg/day doubled bruxism odds independently (aOR = 1.72, p = 0.008). Caffeine dosing greater than 300 mg/day coerce the potent adenosine receptor antagonist that maximizes waking brain-dopaminergic and central noradrenergic drive, and minimizes slow-wave sleep-promoting processes resulting in deepening of sleep and nocturnal brain micro-arousals, and directly facilitates the activation of skeletal muscle motor units (Alencar et al., 2023).

In addition, regular nail or object biting was the second strongest independent predictor in the adjusted model (aOR = 2.31, $p < 0.001$) strengthening the findings of Alencar et al. (2023). Both awake bruxism and oral parafunctional activities have similar neurobehavioral reinforcement mechanisms, and are been identified as subconscious self-regulatory techniques during periods of cognitive overload or apprehensive stress, conditioning repetitive trigeminal motor habits.

4.6 Clinical Implications for Temporomandibular Health and Campus Prevention

From a clinical dental standpoint, the identification of 41.3% of students with bruxism and 56.8% of students with combined bruxism suffering from moderate-to-severe TMD on the Fonseca Anamnestic Index highlights the profound biomechanical morbidity of untreated parafunction. Prolonged cyclic isometric clenching increases intra-articular pressure of the temporomandibular joint, constricts the perfusion of synovial fluid, causes local hypoxia, and gives rise to myofascial trigger points within the masticatory muscles of the body, which manifest as chronic and refractory orofacial pain (Kadıoğlu et al., 2025; Zieliński et al., 2024). As university students are young adults, behavioral self-regulation strategies are crucial to avoid the development of refractory TMD.

Universities and student health clinics should employ a comprehensive, multi-level approach to bruxism and TMD prevention:

1. All approved annual university dental and primary care intake forms should include brief validated bruxism and TMD screening items.
2. Cognitive-behavioral interventions focused on stress management, mindfulness-based stress reduction, and habit-reversal (e.g. "lips together teeth apart" ecological reminders) training for awake bruxism and nail/object chewing/biting.
3. Community-wide campaigns on sleep hygiene and stimulant moderation for students in high-stress Health Sciences faculties.

4.7 Methodological Strengths and Limitations

The strengths of this study are characterized by the use of a large, statistically powered multidisciplinary sample from 3 different faculties, a stratified random cluster sampling methodology, and analysis of awake, sleep, and awake-sleep combined bruxism phenotypes. The study was also strengthened by the use of internationally validated instruments (psychometric and dental: PSS-10, HADS, PSQI, and FAI) and comprehensive multivariable adjustment of confounders.

Nevertheless, some limitations deserve mentioning. First of all, the cross-sectional nature of the research does not allow causal implications; although previous findings imply that stress and sleep disruption have a causal role in bruxism, it is conceivable that pain from chronic orofacial pain and sleep fragmentation can reasonably have a reciprocal effect in aggravating anxiety and stress. Second of all, self-reported instruments resulted in the definition of the sample at the level of "possible" (subject-based) bruxism, versus "probable" or "definite" (instrument-based) bruxism using the criteria of clinical intraoral assessment of dental wear or masticatory hypertrophy and instrumental electromyography or polysomnography (Bracci et al., 2023). Self-reporting might be influenced by small recall bias or over-referral due to the diagnostic perception of the students of Health Sciences. Future prospective longitudinal studies using smartphone-based Ecological Momentary Assessment (EMA) combining with dental examination and ambulatory electromyography would be valuable for observing dynamic changes in masticatory muscle activity across semesters.

5. CONCLUSION

Self-reported bruxism is highly prevalent among university students with 48.4% (Multidisciplinary group) of the students reporting having some form of bruxism. Bruxism is 2.3 times more prevalent as isolated awake bruxism (24.1%) than it is as isolated sleep bruxism (11.7%), with combined bruxism at 12.7% being associated with the highest psychological and somatic burden. Isolated sleep bruxism and combined bruxism are associated with 2.09 and 4.11 times higher psychological and somatic burden, respectively than no bruxism, whereas both isolated awake bruxism and combined bruxism are associated with 2.89 and 3.84 times greater oro-facial pain, respectively. High- and moderate perceived stress, object biting habits, high levels of anxiety, poor sleep quality, high caffeine intake, Health Sciences programs and female biological sex are important predictor variables of self-reported bruxism, with bruxism exhibiting high correlation with moderate-to-severe TMD symptoms. Accordingly, screening strategies and targeted behavioral therapy in the form of habitual bite behavior

modification, sleep hygiene improvements, and stress management interventions should be implemented to prevent the development of stomatognathic disorders in the long term in this population of vulnerable young adults.

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