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Behavioral and Clinical Correlates of Frequent Self-Reported Sleep Bruxism Among Thai Participants: A Cross-Sectional Study

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ABSTRACT

Sleep bruxism is a sleep-related masticatory muscle activity that has been associated with psychological stress, lifestyle behaviors, and various oral symptoms. However, evidence regarding these associations in the Thai population remains limited. This study investigated the associations between psychological stress, lifestyle behaviors, and morning symptoms in relation to frequent self-reported sleep bruxism among Thai participants. A cross-sectional online survey was conducted among 92 Thai participants using a structured questionnaire. Data were collected on demographic characteristics, sleep bruxism frequency, perceived psychological stress, bedtime lifestyle behaviors (including caffeine consumption, alcohol use, smoking, and bedtime), daytime tooth clenching, sleep-related respiratory conditions, and morning symptoms. Frequent sleep bruxism was defined as episodes occurring at least once per week. Associations were evaluated using Chi-square or Fisher's exact tests, followed by multivariable logistic regression to examine adjusted associations. Model performance was assessed using receiver operating characteristic (ROC) analysis. the 92 participants, 28 (30.4%) reported frequent sleep bruxism. Daytime tooth clenching was significantly associated with frequent sleep bruxism in the univariable analysis (OR = 2.58, 95% CI: 1.03–6.41, $p = 0.039$), while morning jaw or facial pain showed the strongest association (OR = 7.54, 95% CI: 2.80–20.29, $p < 0.001$). Caffeine consumption before bedtime demonstrated a non-significant positive trend (OR = 2.17, 95% CI: 0.87–5.43, $p = 0.094$). After multivariable adjustment, no independent association remained statistically significant, although daytime tooth clenching showed the largest effect size (adjusted OR = 1.80, 95% CI: 0.92–3.54, $p = 0.088$). The multivariable model demonstrated modest discrimination (AUC = 0.678) with satisfactory calibration (Hosmer–Lemeshow $p = 0.876$). Frequent self-reported sleep bruxism was commonly reported in this study population and was associated with daytime tooth clenching and morning jaw or facial pain in univariable analyses. Although no independent factors were identified after adjustment, the findings support the multifactorial nature of sleep bruxism and highlight the importance of comprehensive behavioral and clinical assessment. Larger prospective studies using validated psychological instruments and objective diagnostic methods are warranted.

INTRODUCTION

Background

Sleep bruxism (SB) is a sleep-related movement behavior characterized by repetitive jaw-muscle activity during sleep, including clenching, grinding, or thrusting of the mandible. According to the International Classification of Sleep Disorders, Third Edition (ICSD-3), sleep bruxism is considered a behavior rather than a disease in otherwise healthy individuals. Nevertheless, persistent or frequent sleep bruxism may contribute to adverse oral and systemic health outcomes, including tooth wear, temporomandibular disorders (TMD), masticatory muscle pain, headaches, impaired sleep quality, and reduced quality of life.

Recent epidemiological studies estimate that the prevalence of sleep bruxism among participants ranges from 8% to 31%, depending on diagnostic methods, age, and study population. Because definitive diagnosis often requires polysomnography or electromyography, many epidemiological investigations rely on self-reported questionnaires, which remain practical and widely accepted for population-based research.

Psychological Stress and Sleep Bruxism

Accumulating evidence suggests that psychological factors, particularly stress, anxiety, and emotional tension, are among the strongest contributors to sleep bruxism. Individuals experiencing occupational stress, academic pressure, or emotional distress are more likely to exhibit increased jaw-muscle activity during sleep. Stress-related activation of the autonomic nervous system has been proposed as an important mechanism linking emotional disturbances with nocturnal masticatory muscle activity.

However, findings remain inconsistent across different populations, indicating that stress alone may not fully explain the occurrence of sleep bruxism.

Lifestyle Behaviors

Lifestyle behaviors have also been implicated in the development of sleep bruxism. Consumption of caffeine, alcohol, nicotine, and other stimulants before bedtime may alter sleep architecture and increase sleep

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fragmentation, potentially triggering jaw-muscle activity during sleep. In addition, daytime tooth clenching has been reported as a behavioral pattern associated with increased nocturnal bruxism. These modifiable behaviors may represent important intervention targets for reducing the burden of sleep bruxism.

Morning Symptoms

Sleep bruxism frequently manifests through clinical symptoms experienced upon awakening. Common complaints include jaw-muscle pain, tooth sensitivity, headache, facial muscle fatigue, and limited mouth opening. Although these symptoms are commonly reported in clinical practice, their relationships with stress and lifestyle behaviors have not been fully investigated in community-based populations.

Understanding these associations could improve early screening strategies and facilitate multidisciplinary management involving dentists, physicians, psychologists, and sleep specialists.

Research Gap

Although previous studies have examined sleep bruxism in European and Japanese populations, evidence from Southeast Asia, particularly Thailand, remains scarce. Existing Thai studies have primarily focused on prevalence or clinical characteristics and have rarely evaluated the combined influence of psychological stress, lifestyle behaviors, and morning symptoms within the same analytical framework.

Furthermore, limited evidence is available regarding behavioral factors that may be modified through preventive interventions among Thai participants.

Objective

Therefore, the present study aimed to investigate the associations between psychological stress, lifestyle behaviors, and morning symptoms among Thai participants with self-reported sleep bruxism using a cross-sectional survey.

We hypothesized that higher psychological stress and unhealthy lifestyle behaviors would be associated with more frequent sleep bruxism and a greater prevalence of morning symptoms.

MATERIALS AND METHODS

Study Design

This study employed a cross-sectional analytical design to investigate the associations between psychological stress, lifestyle behaviors, and morning symptoms among Thai participants with self-reported sleep bruxism. Data were collected using an anonymous online questionnaire developed specifically for this study. The study followed the recommendations of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement for reporting observational research.

Study Population and Participants

Participants were Thai participants aged 13 years or older who were able to read and understand the Thai language and voluntarily agreed to participate in the study. Individuals with incomplete questionnaires or duplicate submissions were excluded from the final analysis.

A total of 92 complete responses were included in the statistical analysis.

Sampling Method

A convenience sampling technique was employed. The questionnaire was distributed through online social media platforms and messaging applications between (Month Year – Month Year).

Participation was entirely voluntary, and respondents were informed about the study objectives before completing the questionnaire.

Research Instrument

The questionnaire consisted of four sections.

Section I: Demographic Characteristics

- Sex
- Age
- Occupation

Section II: Sleep Bruxism Characteristics

Participants were asked about

- Frequency of sleep bruxism
- Method of recognizing sleep bruxism
- History of sleep-related respiratory disorders
- Daytime tooth clenching

Section III: Lifestyle Behaviors

Participants reported behaviors before bedtime including

- Coffee consumption
- Tea consumption
- Energy drinks
- Alcohol use
- Cigarette smoking
- Bedtime

Section IV: Psychological Stress and Morning Symptoms

- Participants rated
- Perceived stress level
- Jaw muscle pain
- Tooth sensitivity
- Morning headache
- Difficulty opening the mouth
- Other symptoms related to sleep bruxism

Variables

Dependent Variable

The primary outcome was frequent sleep bruxism.

Sleep bruxism frequency was dichotomized as follows:

Frequent sleep bruxism (≥1 episode per week)

Infrequent sleep bruxism (<1 episode per week)

Independent Variables

- Independent variables included
- Sex
- Age
- Occupation
- Sleep-related respiratory disease
- Psychological stress level

- Daytime tooth clenching
- Caffeine consumption
- Alcohol consumption
- Smoking
- Bedtime

Data Collection

Data were collected electronically using Google Forms.
The questionnaire required approximately 5–7 minutes to complete.No personally identifiable information was collected.

Statistical Analysis

Data were analyzed using SPSS Statistics.Continuous variables were summarized using means and standard deviations (SD), while categorical variables were presented as frequencies and percentages.Associations between categorical variables were evaluated using the Chi-square test or Fisher's exact test when appropriate.Variables with a p-value <0.20 in univariate analyses were entered into a multivariable logistic regression model to identify independent predictors of frequent sleep bruxism. Results were reported as adjusted odds ratios (AORs) with 95% confidence intervals (95% CIs). A two-sided p-value <0.05 was considered statistically significant.

Ethical Considerations

Participation in this study was voluntary.
Electronic informed consent was obtained before participants accessed the questionnaire.
All responses were anonymous and confidential.
The study complied with the principles of the Declaration of Helsinki for research involving human participants.

RESULTS AND DISCUSSION

Participant Characteristics

A total of 92 Thai participants completed the online questionnaire and were included in the final analysis.

Table 1: Demographic characteristics of participants (N = 92)

Variables	Parameters	n	%
Sex	Female	66	71.7
	Male	24	26.1
	Prefer not to answer	2	2.2
Age group	13–18 years	37	40.2
	19–25 years	8	8.7
	26–30 years	4	4.3
	≥30 years	43	46.7
Occupation	Student	40	43.5
	Government/private employee	49	53.3
	Homemaker	2	2.2
	Business owner	1	1.1
Sleep-related respiratory disease	Yes	43	46.7
	No	49	53.3

Among the participants, 66 (71.7%) were female, 24 (26.1%) were male, and 2 (2.2%) preferred not to disclose their sex.
The largest age group was ≥30 years (43 participants, 46.7%), followed by 13–18 years (37 participants, 40.2%), 19–25 years (8 participants, 8.7%), and 26–30 years (4 participants, 4.3%).
Regarding occupation, 49 participants (53.3%) were government employees or private-sector workers, 40 (43.5%) were students, 2 (2.2%) were homemakers, and 1 (1.1%) owned a private business.
Approximately 46.7% (43/92) reported a history of sleep- or respiratory-related conditions (e.g., allergic rhinitis, snoring, or obstructive sleep apnea), whereas 53.3% (49/92) reported no such conditions.

Characteristics of Sleep Bruxism

Most participants reported infrequent sleep bruxism, with 64 individuals (69.6%) experiencing episodes only once or twice per month.
More frequent sleep bruxism was reported by 11 participants (12.0%) who experienced episodes 1–2 days per week, 7 participants (7.6%) with episodes 3–4 days per week, and 10 participants (10.9%) who reported sleep bruxism every night.
Participants most commonly recognized their sleep bruxism through self-awareness during partial awakening (41.3%), followed by being informed by a family member or bed partner (34.8%).

Table 2: Sleep bruxism characteristics

Variables	Parameters	n	%
Sleep bruxism frequency	1–2 times/month	64	69.6
	1–2 days/week	11	12.0
	3–4 days/week	7	7.6
	Every night	10	10.9

Morning Symptoms

Morning jaw-related symptoms were frequently reported. The most common symptom was jaw or facial muscle pain (29.3%), followed by tooth sensitivity (19.6%), temporal headache (12.0%), and difficulty opening the mouth or jaw clicking (9.8%).
Only a small proportion of respondents reported no morning symptoms.

Table 3: Morning symptoms reported after waking

Symptom	n	%
Jaw/facial pain	27	29.3
Tooth sensitivity	18	19.6
Temporal headache	11	12.0
Difficulty opening mouth / jaw clicking	9	9.8

Lifestyle Behaviors

Among bedtime lifestyle behaviors, caffeine-containing beverages (coffee, tea, or soft drinks) were the most frequently reported (46 participants, 50.0%).

Alcohol consumption before bedtime was reported by 10 participants (10.9%), while cigarette smoking was uncommon.

Regarding daytime behavior, 31 participants (33.7%) reported occasionally clenching their teeth during the day, whereas 10 participants (10.9%) reported doing so frequently.

Table 4: Lifestyle behaviors

Variable	n	%
Coffee/tea/soft drinks before bedtime	46	50.0
Alcohol before bedtime	10	10.9
Daytime clenching (sometimes)	31	33.7
Daytime clenching (frequently)	10	10.9

Psychological Stress

Most participants reported moderate perceived stress (54.3%), followed by high stress (17.4%) and low stress (14.1%). Only one participant reported the highest level of stress.

These findings indicate that the majority of respondents experienced at least moderate psychological stress during the study period.

Inferential Analysis

Inferential analyses were performed to identify factors associated with frequent sleep bruxism (defined as self-reported sleep bruxism occurring at least 1–2 days per week) and to develop an exploratory prediction model.

Association between participant characteristics and frequent sleep bruxism

Associations between demographic characteristics and frequent sleep bruxism were evaluated using the Chi-square test. As shown in Table 5, none of the demographic variables demonstrated a statistically significant association with frequent sleep bruxism.

Female participants showed a slightly higher odds of frequent sleep bruxism than males (OR = 1.27, 95% CI: 0.46–3.48, p = 0.646). Participants aged ≥19 years had a similar likelihood of frequent sleep bruxism compared with younger participants (OR = 1.06, 95% CI: 0.43–2.62, p = 0.904). Student status was not associated with frequent sleep bruxism (OR = 0.96, 95% CI: 0.39–2.36, p = 0.937). Likewise, participants reporting sleep- or respiratory-related conditions tended to have higher odds of frequent sleep bruxism (OR = 1.83, 95% CI: 0.74–4.48), although this association did not reach statistical significance (p = 0.186).

Table 5: Association between participant characteristics and frequent sleep bruxism

Variable	OR	95% CI	p-value	Statistical test
Female sex	1.27	0.46–3.48	0.646	Chi-square
Age ≥19 years	1.06	0.43–2.62	0.904	Chi-square
Student status	0.96	0.39–2.36	0.937	Chi-square
Sleep-/respiratory-related condition	1.83	0.74–4.48	0.186	Chi-square

Association between psychological stress, lifestyle behaviors, and morning symptoms

Psychological stress, lifestyle behaviors, and morning symptoms were further examined (Table 6). Among all variables evaluated, daytime tooth clenching showed a statistically significant association with frequent sleep bruxism.

Participants who reported daytime tooth clenching had approximately 2.6-fold higher odds of frequent sleep bruxism than those who did not (OR = 2.58, 95% CI: 1.03–6.41, p = 0.039).

Consumption of caffeine-containing beverages before bedtime demonstrated a positive trend toward increased frequent sleep bruxism (OR = 2.17, 95% CI: 0.87–5.43, p = 0.094), although the association did not reach statistical significance.

Among morning symptoms, jaw or facial pain after waking was the strongest correlate of frequent sleep bruxism.

Participants reporting this symptom had 7.54 times higher odds of frequent sleep bruxism than those without jaw pain (95% CI: 2.80–20.29, p < 0.001).

No statistically significant associations were observed for high psychological stress, alcohol consumption, smoking, late bedtime, morning headache, tooth sensitivity, or jaw clicking.

Table 6: Association between psychological stress, lifestyle behaviors, and morning symptoms

Variable	OR	95% CI	p-value
High psychological stress (levels 4–5)	0.65	0.19–2.22	0.493
Daytime tooth clenching	2.58	1.03–6.41	0.039
Caffeine before bedtime	2.17	0.87–5.43	0.094
Alcohol before bedtime	0.23	0.03–1.88	0.273*

Smoking before bedtime	0.44	0.02–9.43	1.000*
Late bedtime (≥00:00)	0.83	0.32–2.15	0.706
Morning jaw/facial pain	7.54	2.80–20.29	<0.001
Morning temporal headache	0.39	0.10–1.48	0.157
Tooth sensitivity	0.37	0.11–1.20	0.088
Limited mouth opening / jaw clicking	1.80	0.61–5.35	0.286

Multivariable logistic regression identifying independent predictors

Variables considered clinically relevant were entered simultaneously into a multivariable logistic regression model, including perceived stress level, daytime tooth clenching, caffeine consumption before bedtime, and sleep-/respiratory-related conditions.

After adjustment, no variable remained statistically significant. Nevertheless, daytime tooth clenching demonstrated the strongest independent association with frequent sleep bruxism (Adjusted OR = 1.80, 95% CI: 0.92–3.54, p = 0.088), indicating a clinically meaningful trend despite the lack of statistical significance.

Stress level, caffeine consumption before bedtime, and sleep-/respiratory-related conditions were not independently associated with frequent sleep bruxism after controlling for other variables.

Table 7: Multivariable logistic regression identifying independent predictors of frequent sleep bruxism

Predictor	**β**	**Adjusted OR**	**95% CI**	**p-value**
Stress level (per 1-point increase)	0.027	1.03	0.60–1.76	0.921
Daytime tooth clenching (per category increase)	0.588	1.80	0.92–3.54	0.088
Caffeine before bedtime	0.595	1.81	0.69–4.73	0.224
Sleep-/respiratory-related condition	0.532	1.70	0.67–4.35	0.266

Predictive performance of the multivariable model

The discriminative performance of the multivariable logistic regression model was evaluated using receiver operating characteristic (ROC) analysis (Figure 2). The model achieved an area under the ROC curve (AUC) of 0.678, indicating acceptable discrimination between participants with frequent and infrequent sleep bruxism.

Using the optimal probability threshold (0.345), the model demonstrated a sensitivity of 67.9% and a specificity of 65.6%. Model calibration was satisfactory according to the Hosmer–Lemeshow goodness-of-fit test (p = 0.876), suggesting good agreement between predicted probabilities and observed outcomes.

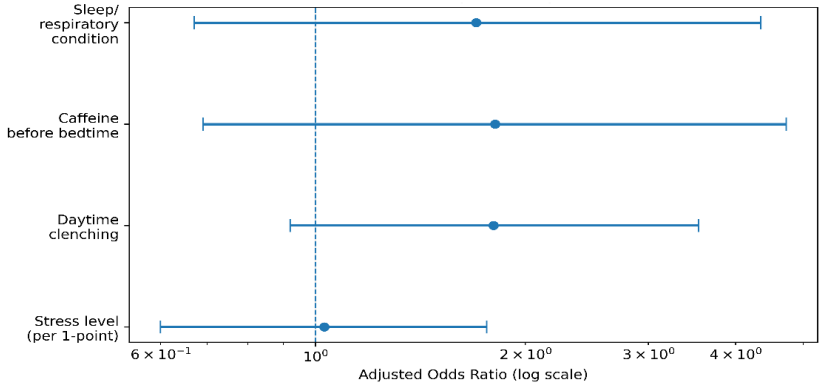

Figure 1: Forest Plot of Adjusted Odds Ratios

Figure 1 presents the adjusted odds ratios and corresponding 95% confidence intervals for all variables included in the multivariable logistic regression model.

The forest plot illustrates that daytime tooth clenching showed the largest positive effect size among the evaluated predictors, although its confidence interval crossed the null value, indicating that statistical significance was not achieved after adjustment.

The ROC curve demonstrated an AUC of 0.679, reflecting moderate predictive ability of the multivariable model. Although the model showed acceptable calibration, its discrimination remained modest, indicating that additional clinical, behavioral, and psychological variables may improve prediction accuracy in future studies.

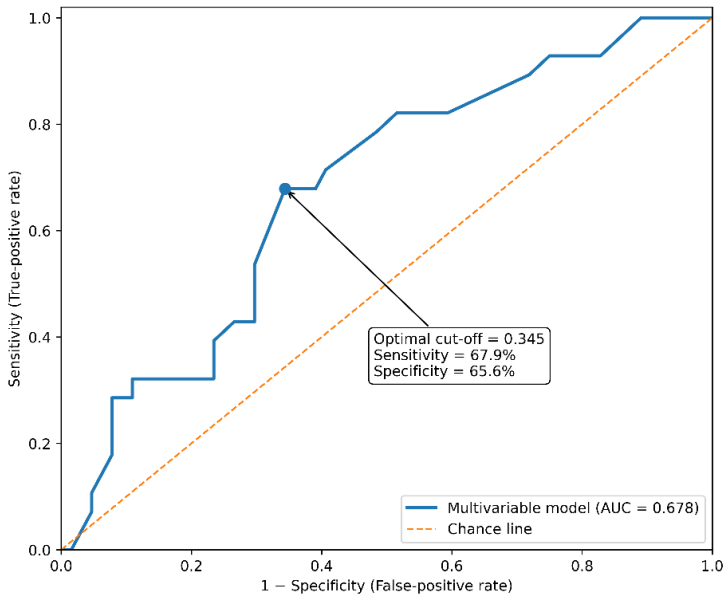

Figure 2: Receiver Operating Characteristic (ROC) Curve

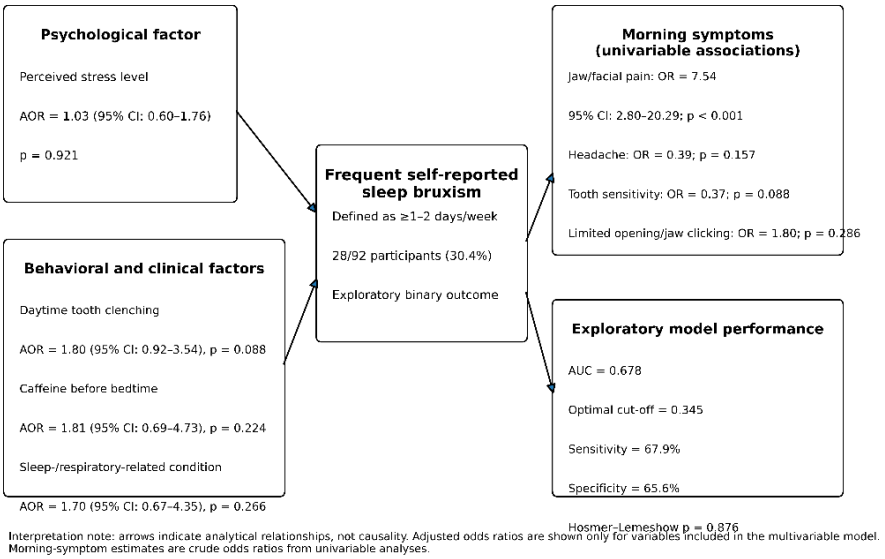

Figure 3: Research Framework

RESULTS AND DISCUSSION

Principal Findings

The present cross-sectional study investigated the relationships between psychological stress, lifestyle behaviors, and morning symptoms among Thai participants with self-reported sleep bruxism. Approximately one-third of participants (30.4%) reported frequent sleep bruxism, indicating that repetitive nocturnal jaw-muscle activity is relatively common in this study population. The principal findings demonstrated that daytime tooth clenching and morning jaw or facial pain were significantly associated with frequent sleep bruxism in univariate analyses. However, after adjustment for psychological stress, caffeine consumption, and sleep-related respiratory conditions, none of the evaluated variables remained statistically significant in the multivariable logistic regression model. These findings suggest that sleep bruxism is a multifactorial condition in which several behavioral and clinical characteristics coexist. Rather than being explained by a single determinant, sleep bruxism appears to arise from the interaction of multiple biological, behavioral, and psychosocial factors.

Daytime Tooth Clenching and Sleep Bruxism

Among all behavioral variables examined, daytime tooth clenching demonstrated the strongest association with frequent sleep bruxism. Participants reporting daytime clenching had approximately 2.6-fold greater odds of experiencing frequent sleep bruxism in the univariate analysis. Although this association became non-significant after multivariable adjustment, the adjusted odds ratio remained elevated, suggesting a clinically meaningful relationship. This observation is biologically

plausible because awake bruxism and sleep bruxism share common mechanisms involving increased masticatory muscle activity and altered motor control. Repetitive clenching during waking hours may reflect heightened muscle activation that persists during sleep. Consequently, individuals who habitually clench their teeth during the day may represent an important target population for preventive behavioral interventions.

From a clinical perspective, dentists should routinely assess daytime clenching habits when evaluating patients with suspected sleep bruxism, as this simple screening question may identify individuals at increased risk.

Psychological Stress

Psychological stress has frequently been reported as a potential contributor to sleep bruxism. In the present study, most participants reported moderate levels of perceived stress, whereas fewer participants experienced high stress. Although stress level was not independently associated with frequent sleep bruxism after adjustment for other variables, the high prevalence of moderate stress suggests that psychological factors remain relevant in this population.

One possible explanation is that the current questionnaire assessed stress using a single self-rated item rather than a validated psychometric instrument. Single-item measures may not fully capture the multidimensional nature of psychological stress, including chronic stress, emotional exhaustion, anxiety, and coping capacity. Consequently, misclassification of stress severity may have reduced the ability to detect significant associations.

Future studies should employ validated instruments such as the Perceived Stress Scale (PSS-10) or Depression Anxiety Stress Scales (DASS-21) to improve measurement precision.

Lifestyle Behaviors

Lifestyle behaviors have been proposed as modifiable contributors to sleep bruxism. In the present study, approximately half of participants reported consuming caffeine-containing beverages before bedtime. Although caffeine consumption showed a positive association with frequent sleep bruxism, statistical significance was not achieved.

Caffeine may influence sleep physiology by increasing sleep latency, reducing total sleep time, and increasing nocturnal arousals. These mechanisms could theoretically enhance rhythmic masticatory muscle activity during sleep. Nevertheless, the present findings indicate that caffeine alone is unlikely to explain the occurrence of frequent sleep bruxism.

Similarly, alcohol consumption and cigarette smoking were not significantly associated with frequent sleep bruxism. These findings should be interpreted cautiously because relatively few participants reported these behaviors, limiting statistical power.

Morning Symptoms

Morning jaw or facial pain was the strongest clinical correlate identified in this study. Participants experiencing jaw pain upon awakening exhibited substantially higher odds of frequent sleep bruxism than those without such symptoms.

This finding supports current understanding that repetitive nocturnal jaw-muscle activity may overload the masticatory muscles, resulting in muscle fatigue, tenderness, and pain after awakening. Although jaw pain should not be considered a diagnostic criterion for sleep bruxism, it may serve as a practical clinical indicator prompting further assessment.

Interestingly, headache, tooth sensitivity, and limited mouth opening did not demonstrate statistically significant associations in the present study. These symptoms are likely influenced by multiple factors, including temporomandibular disorders, occlusal conditions, and other dental pathologies, rather than sleep bruxism alone.

Clinical Implications

The present findings have several important implications for clinical practice.

First, simple behavioral questions regarding daytime tooth clenching and morning jaw pain may improve early identification of individuals at increased risk of sleep bruxism in general dental practice.

Second, although psychological stress was not an independent predictor in the present analysis, clinicians should continue to consider psychosocial factors during patient assessment because stress may indirectly contribute to maladaptive oral behaviors.

Third, patient education focusing on behavioral modification—including reducing daytime clenching, improving sleep hygiene, and limiting stimulant consumption before bedtime—may complement conventional dental management.

Finally, effective management of sleep bruxism may require multidisciplinary collaboration among dentists, physicians, psychologists, and sleep specialists.

Strengths

This study has several strengths. It simultaneously evaluated demographic characteristics, psychological stress, lifestyle behaviors, and morning symptoms within a single analytical framework. Furthermore, the study represents one of the few investigations examining behavioral correlates of sleep bruxism in a Thai population. The use of multivariable logistic regression also enabled adjustment for potential confounding variables when exploring independent associations.

Limitations

Several limitations should be acknowledged.

First, the cross-sectional design precludes causal inference; therefore, temporal relationships between psychological stress, lifestyle behaviors, and sleep bruxism cannot be

established.

Second, sleep bruxism was assessed using self-reported information rather than polysomnography or electromyography, which remain the reference standards for diagnosis.

Third, the relatively small sample size (n = 92) limited statistical power, particularly for multivariable regression analyses. This limitation may partly explain why several variables showed clinically meaningful effect sizes but failed to reach statistical significance.

Fourth, the study employed convenience sampling, which may reduce generalizability to the broader Thai population.

Finally, because the sample included both adolescents and adults, the findings may not fully represent adult populations alone. Future studies should consider age-stratified analyses or recruit larger samples within specific age groups.

Future Directions

Future research should recruit larger and more representative samples to improve statistical precision and external validity. Prospective cohort studies are warranted to clarify temporal relationships between psychological stress, lifestyle behaviors, and sleep bruxism. In addition, validated measures of perceived stress (PSS-10), sleep quality (PSQI), anxiety (GAD-7), and depression (PHQ-9) should be incorporated to improve assessment of psychological factors. Objective diagnostic methods, including ambulatory electromyography or polysomnography, would further strengthen future investigations.

Advanced analytical approaches, such as structural equation modeling or machine-learning prediction models, may also help elucidate the complex interactions among psychological, behavioral, and clinical determinants of sleep bruxism.

CONCLUSION

This cross-sectional study investigated the relationships between psychological stress, lifestyle behaviors, and morning symptoms among Thai participants with self-reported sleep bruxism. Approximately one-third of participants reported frequent sleep bruxism, highlighting that this condition is relatively common within the study population.Among the evaluated variables, daytime tooth clenching demonstrated a significant association with frequent sleep bruxism in the univariate analysis, while morning jaw or facial pain emerged as the strongest clinical correlate. Although no independent predictor remained statistically significant after multivariable adjustment, the observed trends suggest that sleep bruxism is a multifactorial condition influenced by the interaction of behavioral, psychological, and clinical factors rather than by a single determinant.

The multivariable prediction model demonstrated acceptable discrimination (AUC = 0.678) and good calibration (Hosmer–Lemeshow p = 0.876), indicating that the proposed analytical framework may provide a useful basis for future predictive studies. However, its predictive performance remains moderate, emphasizing the need for additional clinical and psychological variables to improve model accuracy.

Overall, the findings suggest that behavioral assessment, particularly regarding daytime tooth clenching and morning jaw pain, may facilitate early identification of individuals at risk of frequent sleep bruxism. These observations support the integration of behavioral counseling, stress management, and oral health education into multidisciplinary approaches for sleep bruxism prevention and management.

The findings of this study have several practical implications for clinical practice and public health.

- Routine screening for daytime tooth clenching and morning jaw pain should be incorporated into dental examinations to facilitate early identification of individuals with suspected sleep bruxism.
- Behavioral modification strategies, including reducing daytime clenching awareness, improving sleep hygiene, and minimizing caffeine intake before bedtime, may contribute to reducing the frequency of sleep bruxism.
- Dentists should collaborate with physicians, psychologists, and sleep specialists when managing patients presenting with persistent sleep bruxism accompanied by psychological stress or sleep-related disorders.
- Community-based oral health promotion programs may incorporate sleep bruxism education as part of preventive healthcare initiatives.

Future investigations should recruit larger and more representative populations to improve statistical power and external validity. Longitudinal cohort studies are recommended to establish temporal and causal relationships between psychological stress, lifestyle behaviors, and sleep bruxism.

Validated psychometric instruments, including the Perceived Stress Scale (PSS-10), Pittsburgh Sleep Quality Index (PSQI), Generalized Anxiety Disorder-7 (GAD-7), and Patient Health Questionnaire-9 (PHQ-9), should be incorporated to improve assessment of psychological determinants.

Future studies should also consider objective diagnostic techniques, such as ambulatory electromyography or polysomnography, to improve diagnostic accuracy. Advanced analytical approaches, including structural equation modeling and machine-learning algorithms, may further enhance prediction of frequent sleep bruxism and support development of individualized prevention strategies.

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Conflict of Interest
The authors declare that there is no conflict of interest

Data Availability Statement
The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request.

Ethical Approval
This study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Electronic informed consent was obtained from all participants prior to participation. The study protocol was reviewed and approved by the CADET-TUTOR Research Ethics Committee (CT-REC), Thailand (Approval No. CT-REC-2026-06-1).

REFERENCES

Ahlberg, J., Lobbezoo, F., Ahlberg, K., Manfredini, D., Hublin, C., Sinisalo, J., Könönen, M., & Savolainen, A. (2013). Self-reported bruxism mirrors anxiety and stress in adults. *Medicina Oral, Patología Oral y Cirugía Bucal, 18*(1), e7–e11. https://doi.org/10.4317/medoral.18232

Beddis, H., Pemberton, M., & Davies, S. (2018). Sleep bruxism: *An overview for clinicians. British Dental Journal, 225*(6), 497–501. https://doi.org/10.1038/sj.bdj.2018.757

Bertazzo-Silveira, E., Kruger, C. M., Porto De Toledo, I., Porporatti, A. L., Dick, B., Flores-Mir, C., & De Luca Canto, G. (2016). Association between sleep bruxism and alcohol, caffeine, tobacco, and drug abuse: *A systematic review. Journal of the American Dental Association, 147*(11), 859–866.e4. https://doi.org/10.1016/j.adaj.2016.06.014

Carra, M. C., Huynh, N., & Lavigne, G. J. (2012). Sleep bruxism: A comprehensive overview for the dental clinician interested in sleep medicine. *Dental Clinics of North America, 56*(2), 387–413. https://doi.org/10.1016/j.cden.2012.01.003

Chattrattrai, T., Aarab, G., Blanken, T. F., van Someren, E. J. W., & Lobbezoo, F. (2024). Network analysis of sleep bruxism in the EPISONO adult general population. *Journal of Sleep Research, 33*(2), e13957. https://doi.org/10.1111/jsr.13957

Chemelo, V. D. S., Né, Y. G. S., Frazão, D. R., de Souza-Rodrigues, R. D., Fagundes, N. C. F., Magno, M. B., da Silva, C. M. T., Maia, L. C., & Lima, R. R. (2020). Is there association between stress and bruxism? A systematic review and meta-analysis. *Frontiers in Neurology,* 11, 590779. https://doi.org/10.3389/fneur.2020.590779

Ekvitayavetchanukul, P., Bhavani, C., Nath, N., Sharma, L., Aggarwal, G., Singh, R. (2024). Revolutionizing Healthcare: Telemedicine and Remote Diagnostics in the Era of Digital Health. In: Kumar, P., Singh, P., Diwakar, M., Garg, D. (eds) Healthcare Industry Assessment: Analyzing Risks, Security, and Reliability. *Engineering Cyber-Physical Systems and Critical Infrastructures, vol 11*. Springer, Cham. https://doi.org/10.1007/978-3-031-65434-3_11

Ekvitayavetchanukul, P., & Ekvitayavetchanukul, P. (2025). AI-Driven Design Thinking: Transforming Learning Efficiency in Pre-Medical Education. *Medical Research Archives, 13*(4). https://doi.org/10.18103/mra.v13i4.6410

Ekvitayavetchanukul, P., & Ekvitayavetchanukul, P. (2023). Comparing the effectiveness of distance learning and onsite learning in pre-medical courses. *Recent Educational Research, 1*(2), 141-147. https://doi.org/10.59762/rer90410536122023122014351l

Frosztega, W., Wieckiewicz, M., Nowacki, D., Michałek-Zrąbkowska, M., Poręba, R., Wojakowska, A., Kanclerska, J., Mazur, G., & Martynowicz, H. (2022). Polysomnographic assessment of effects of tobacco smoking and alcohol consumption on sleep bruxism intensity. *Journal of Clinical Medicine, 11*(24), 7453. https://doi.org/10.3390/jcm11247453

Frosztega, W., Wieckiewicz, M., Nowacki, D., Poręba, R., Lachowicz, G., Mazur, G., & Martynowicz, H. (2023). The effect of coffee and black tea consumption on sleep bruxism intensity based on polysomnographic examination. *Heliyon, 9*(5), e16212. https://doi.org/10.1016/j.heliyon.2023.e16212

Jiménez-Silva, A., Peña-Durán, C., Tobar-Reyes, J., & Frugone-Zambra, R. (2017). Sleep and awake bruxism in adults and its relationship with temporomandibular disorders: A systematic review from 2003 to 2014. *Medicina Oral, Patología Oral y Cirugía Bucal, 22*(6), e706–e712. https://doi.org/10.4317/medoral.22305

Kiatsoongsong, P., & Ekvitayavetchanukul, P. (2025). Associations Between Daily PM2.5 Exposure and Respiratory Symptoms in Thai Adolescents: Evidence from Nonthaburi Province. *American Journal of Environment and Climate, 4*(3), 59-68. https://doi.org/10.54536/ajec.v4i3.5093

Lavigne, G. J., Khoury, S., Abe, S., Yamaguchi, T., & Raphael, K. (2008). Bruxism physiology and pathology: An overview for clinicians. *Journal of Oral Rehabilitation, 35*(7), 476–494. https://doi.org/10.1111/j.1365-2842.2008.01881.x

Lobbezoo, F., Ahlberg, J., Glaros, A. G., Kato, T., Koyano, K., Lavigne, G. J., de Leeuw, R., Manfredini, D., Svensson, P., & Winocur, E. (2013). Bruxism defined and graded: An international consensus. *Journal of Oral Rehabilitation, 40*(1), 2–4. https://doi.org/10.1111/joor.12011

Lobbezoo, F., Ahlberg, J., Raphael, K. G., Wetselaar, P., Glaros, A. G., Kato, T., Santiago, V., Winocur, E., De Laat, A., De Leeuw, R., Koyano, K., Lavigne, G. J., Svensson, P., & Manfredini, D. (2018). International consensus on the assessment of bruxism: Report of a work in progress. *Journal of Oral Rehabilitation, 45*(11),

837–844. https://doi.org/10.1111/joor.12663

Manfredini, D., Winocur, E., Guarda-Nardini, L., Paesani, D., & Lobbezoo, F. (2013). Epidemiology of bruxism in adults: A systematic review of the literature. *Journal of Orofacial Pain, 27*(2), 99–110. https://doi.org/10.11607/jop.921

Manfredini, D., Lobbezoo, F., & Ahlberg, J. (2016). Current concepts of bruxism. *International Journal of Prosthodontics, 29*(5), 437–438. https://doi.org/10.11607/ijp.4880

Manfredini, D., Ahlberg, J., Lavigne, G. J., Svensson, P., & Lobbezoo, F. (2024). Five years after the 2018 consensus definitions of sleep and awake bruxism: An explanatory note. *Journal of Oral Rehabilitation, 51*(3), 623–624. https://doi.org/10.1111/joor.13626

Martynowicz, H., Smardz, J., Michałek-Zrąbkowska, M., Gac, P., Poręba, R., Wojakowska, A., Mazur, G., & Wieckiewicz, M. (2019). Evaluation of relationship between sleep bruxism and Headache Impact Test-6 scores: A polysomnographic study. *Frontiers in Neurology,* 10, 487. https://doi.org/10.3389/fneur.2019.00487

Mathasuriyapong, P., Korcharlermsonthi, N., Ekvitayavetchanukul, P., & Ekvitayavetchanukul, P. (2025). Modeling the health burden of PM2.5: Forecasting hospital admissions and medical demand in Bangkok and neighboring regions. *Journal of Posthumanism, 5*(6), 862–873. https://doi.org/10.63332/joph.v5i6.2155

Melo, G., Duarte, J., Pauletto, P., Porporatti, A. L., Stuginski-Barbosa, J., Winocur, E., Flores-Mir, C., & De Luca Canto, G. (2019). Bruxism: An umbrella review of systematic reviews. *Journal of Oral Rehabilitation, 46*(7), 666–690. https://doi.org/10.1111/joor.12801

Michałek-Zrąbkowska, M., Wieckiewicz, M., Macek, P., Gac, P., Smardz, J., Wojakowska, A., Poręba, R., Mazur, G., & Martynowicz, H. (2020). The relationship between simple snoring and sleep bruxism: A polysomnographic study. *International Journal of Environmental Research and Public Health, 17*(23), 8960. https://doi.org/10.3390/ijerph17238960

Ohayon, M. M., Li, K. K., & Guilleminault, C. (2001). Risk factors for sleep bruxism in the general population. *Chest, 119*(1), 53–61. https://doi.org/10.1378/chest.119.1.53

Polmann, H., Domingos, F. L., Melo, G., Stuginski-Barbosa, J., da Silva Guerra, E. N., Porporatti, A. L., Dick, B. D., Flores-Mir, C., & De Luca Canto, G. (2019). Association between sleep bruxism and anxiety symptoms in adults: A systematic review. *Journal of Oral Rehabilitation, 46*(5), 482–491. https://doi.org/10.1111/joor.12785

Polmann, H., Réus, J. C., Massignan, C., Serra-Negra, J. M., Dick, B. D., Flores-Mir, C., Lavigne, G. J., & De Luca Canto, G. (2021). Association between sleep bruxism and stress symptoms in adults: A systematic review and meta-analysis. *Journal of Oral Rehabilitation, 48*(5), 621–631. https://doi.org/10.1111/joor.13142

Prado, I. M., Abreu, L. G., Pordeus, I. A., Amin, M., Paiva, S. M., & Serra-Negra, J. M. (2023). Diagnosis and prevalence of probable awake and sleep bruxism in adolescents: An exploratory analysis. *Brazilian Dental Journal, 34*(3), 9–24. https://doi.org/10.1590/0103-6440202305202

Réus, J. C., Polmann, H., Souza, B. D. M., Flores-Mir, C., Lavigne, G. J., & De Luca Canto, G. (2024). Associations between sleep bruxism and primary headaches: A cross-sectional polysomnographic study. *Journal of Oral & Facial Pain and Headache, 38*(4), 189–197. https://doi.org/10.22514/jofph.2024.038

Rintakoski, K., & Kaprio, J. (2013). Legal psychoactive substances as risk factors for sleep-related bruxism: A nationwide Finnish Twin Cohort study. *Alcohol and Alcoholism, 48*(4), 487–494. https://doi.org/10.1093/alcalc/agt016

Ronsivalle, V., Marrapodi, M. M., Siurkel, Y., Cicciù, M., & Minervini, G. (2024). Prevalence of bruxism in alcohol abusers: A systematic review conducted according to PRISMA guidelines and the Cochrane handbook for systematic reviews of interventions. *BMC Oral Health, 24*, 108. https://doi.org/10.1186/s12903-024-03862-1

Saczuk, K., Lapinska, B., Wilmont, P., Pawlak, L., & Lukomska-Szymanska, M. (2019a). Relationship between sleep bruxism, perceived stress, and coping strategies. *International Journal of Environmental Research and Public Health, 16*(17), 3193. https://doi.org/10.3390/ijerph16173193

Saczuk, K., Lapinska, B., Wilmont, P., Pawlak, L., & Lukomska-Szymanska, M. (2019b). The Bruxoff device as a screening method for sleep bruxism in dental practice. *Journal of Clinical Medicine, 8*(7), 930. https://doi.org/10.3390/jcm8070930

Smardz, J., Martynowicz, H., Wojakowska, A., Michałek-Zrąbkowska, M., Mazur, G., & Wieckiewicz, M. (2019). Correlation between sleep bruxism, stress, and depression—A polysomnographic study. *Journal of Clinical Medicine, 8*(9), 1344. https://doi.org/10.3390/jcm8091344

Soares, J. P., Moro, J., Massignan, C., Cardoso, M., Serra-Negra, J. M., Maia, L. C., & Bolan, M. (2021). Prevalence of clinical signs and symptoms of the masticatory system and their associations in children with sleep bruxism: A systematic review and meta-analysis. *Sleep Medicine Reviews, 57*, 101468. https://doi.org/10.1016/j.smrv.2021.101468

Sutabutra, T., Rujachan, P., Manasakorn, K., Sripetchnai, M., & Ekvitayavetchanukul, P. (2025). The impact of design thinking vs rote learning on secondary student achievement: An experimental study in Bangkok schools. *Asian Journal of Education and Social Studies, 51*(2), 411–422. https://doi.org/10.9734/ajess/2025/v51i21794

Verhoeff, M. C., Lobbezoo, F., Ahlberg, J., Bender, S. D., Bracci, A., Colonna, A., Dal Fabbro, C., Durham, J., Glaros, A. G., Häggman-Henrikson, B., Kato, T.,

Koutris, M., Lavigne, G. J., Nykänen, L., Raphael, K. G., Svensson, P., Wieckiewicz, M., & Manfredini, D. (2025). Updating the bruxism definitions: Report of an international consensus meeting. *Journal of Oral Rehabilitation, 52*(9), 1335–1342. https://doi.org/10.1111/joor.13985

Vieira, K. R. M., Folchini, C. M., Heyde, M. D. V. D., Stuginski-Barbosa, J., Kowacs, P. A., & Piovesan, E. J. (2020). Wake-up headache is associated with sleep bruxism. *Headache, 60*(5), 974–980. https://doi.org/10.1111/head.13816

Vlădutu, D., Popescu, S. M., Mercut, V., Ionescu, M., Scrieciu, M., Glodeanu, A. D., Stănusi, A., & Mercut, R. (2022). Associations between bruxism, stress, and manifestations of temporomandibular disorder in young students. *International Journal of Environmental Research and Public Health, 19*(9), 5415. https://doi.org/10.3390/ijerph19095415

Wieckiewicz, M., Paradowska-Stolarz, A., & Wieckiewicz, W. (2014). Psychosocial aspects of bruxism: The most paramount factor influencing teeth grinding. *BioMed Research International, 2014*, 469187. https://doi.org/10.1155/2014/469187

Winocur, E., Uziel, N., Lisha, T., Goldsmith, C., & Eli, I. (2011). Self-reported bruxism—Associations with perceived stress, motivation for control, dental anxiety and gagging. *Journal of Oral Rehabilitation, 38*(1), 3–11. https://doi.org/10.1111/j.1365-2842.2010.02118.x

Zieliński, G., Pająk, A., & Wójcicki, M. (2024). Global prevalence of sleep bruxism and awake bruxism in pediatric and adult populations: A systematic review and meta-analysis. *Journal of Clinical Medicine, 13*(14), 4259. https://doi.org/10.3390/jcm13144259