



## FACTORS INFLUENCING SLEEP BRUXISM AMONG POLICE PERSONNEL AT BANDA ACEH CITY POLICE DEPARTMENT

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### ABSTRACT

Police personnel at Banda Aceh City Police Department (Polresta Banda Aceh) face high job demands, psychological pressure, and complex working conditions that may affect their physical and mental health, potentially contributing to sleep bruxism. This condition not only affects dental health and sleep quality but may also impact the quality of life and work performance of police personnel. Various psychological, biological, and lifestyle factors are thought to contribute to the occurrence of sleep bruxism. To analyze factors associated with sleep bruxism among police personnel at Polresta Banda Aceh. This quantitative study employed a cross-sectional design. Data were collected using an online questionnaire administered through Google Forms. The study sample consisted of 573 police personnel who met the inclusion criteria, selected using total sampling. Data were analyzed using univariate analysis, bivariate analysis using logistic regression, and multivariate analysis using multiple logistic regression, with a significance level of  $p < 0.05$ . The results showed a significant association between sleep bruxism and moderate anxiety ( $p=0.001$ ), high anxiety ( $p=0.001$ ), moderate work stress ( $p=0.001$ ), poor sleep quality ( $p=0.002$ ), family history ( $p=0.001$ ), medication use ( $p=0.001$ ), and length of employment ( $p=0.005$ ) among police personnel at Polresta Banda Aceh. Multiple logistic regression analysis showed a Pseudo  $R^2$  value of 0.3170, indicating that the variables included in the model simultaneously explained approximately 31.70% of the variation in sleep bruxism among police personnel at Polresta Banda Aceh, while the remaining 68.30% may be explained by other factors not included in the model. Sleep bruxism among police personnel is associated with an interaction of psychological, biological, and occupational factors. Therefore, Polresta Banda Aceh, through its Human Resources (HR) division, is expected to coordinate with psychological staff at the Aceh Regional Police (Polda Aceh) to strengthen promotive and preventive efforts through stress management programs, mental health monitoring, and sleep health education to improve the well-being and performance of police personnel at Polresta Banda Aceh.

Keywords: anxiety; police personnel; sleep bruxism; work stress

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## INTRODUCTION

Globally, the prevalence of bruxism is relatively high and varies depending on the measurement methods, population characteristics, and diagnostic tools used. The prevalence of sleep bruxism ranges from 13% to 23%, whereas awake bruxism affects approximately 20% to 30% of the population, with the highest prevalence observed among young adults (Wetselaar, Vermaire, Lobbezoo, & Schuller, 2021). Li, Lobbezoo, Hilgevoord, de Vries, and Aarab (2024) also reported that more than 20% of the global population experiences some form of bruxism during their lifetime. Furthermore, when polysomnography is used as the diagnostic method, the detection rate of sleep bruxism may reach 43%. Another study by Winocur-Arias et al. (2022), demonstrated that bruxism is more common among women and individuals with high levels of anxiety or stress.

Bruxism, defined as the involuntary grinding, rubbing, or clenching of the teeth, is a clinical phenomenon that has increasingly attracted attention in healthcare, particularly in dentistry, psychology, and occupational health. Bruxism is generally classified into two main types, namely

sleep bruxism, which occurs during sleep, and awake bruxism, which occurs while an individual is awake. Both forms may have adverse effects on oral and dental health, the temporomandibular joint, and overall quality of life. This parafunctional activity may lead to tooth wear, restoration fractures, facial muscle pain, headaches, and even sleep disturbances (Zieliński, Pająk, & Wójcicki, 2024).

According to the World Health Organization (WHO), conditions such as bruxism have not yet received sufficient attention within primary healthcare systems, despite their potential impact on quality of life, work productivity, and long-term healthcare expenditure. In 2023, the WHO emphasized the importance of addressing sleep and mild mental health disorders through integrated promotive and preventive health programs. As part of the spectrum of conditions associated with stress and anxiety, bruxism should therefore be considered beyond merely being a dental habit (Atuncar-Salazar, Huertas-Mogollón, Vidigal, & López-Ramos, 2025).

Several factors have been reported to be closely associated with bruxism, including anxiety levels, occupational stress, genetic or hereditary factors, poor sleep quality, length of employment or years of service, physical activity levels, smoking habits, and medication use. Studies by P. B. Hilgenberg-Sydney et al. (2024) dan Saracutu et al. (2024) indicated that anxiety is one of the strongest predictors of bruxism. Individuals with high levels of anxiety have been reported to have a two- to three-fold higher risk of developing sleep bruxism than those with low levels of anxiety. This finding is further supported by studies among shift workers demonstrating an association between sleep disruption and increased bruxism activity.

Smoking and medication use have also been reported to exacerbate the intensity of bruxism. Nicotine may stimulate jaw muscle activity during sleep, whereas alcohol consumption may disrupt REM sleep cycles, which are associated with the regulation of oral motor activity (Vlăduțu et al., 2022). Physical activity also has a complex relationship with bruxism. Adequate physical activity may reduce stress and anxiety levels; however, excessive or irregular physical activity may instead contribute to muscle tension (Amorim, Espirito Santo, Sommer, & Marques, 2021). Hereditary factors should also not be overlooked. Several studies have suggested the involvement of genetic components in certain oral motor activities, although the underlying mechanisms remain under investigation (I. A. Pavlou, D. A. Spandidos, V. Zoumpourlis, & V. K. Papakosta, 2024).

At the national level, Indonesia still has limited data on the prevalence of bruxism, both in the general population and among occupational groups. Most studies have been conducted in limited populations, such as university students, schoolchildren, or dental clinic patients. A study conducted in Yogyakarta in 2022 among junior high school students reported a bruxism prevalence of 4.96%. Another study in Bandung involving dental students found that 27% of respondents reported bruxism symptoms, with most cases being associated with academic stress. However, to date, no large-scale national survey has comprehensively examined the prevalence of bruxism among occupational groups, including security personnel such as police officers (Syafitri, Rahmi, & Putri, 2024).

A quantitative study involving 60 police officers at Wajo Police Resort found that social support and occupational stress significantly influenced personnel job satisfaction. Regression analysis revealed that social support had a positive and significant effect on job satisfaction, accounting for 43.70% of the variance. Conversely, occupational stress had a negative and significant effect on job satisfaction, indicating that higher levels of stress experienced by police personnel were associated with lower levels of job satisfaction (Pratiwi, 2023). These findings highlight the important role of social support in improving job satisfaction, while occupational stress represents a risk factor that requires attention in the police work environment.

Aceh, as a province characterized by distinctive sociopolitical and cultural conditions, also lacks local data on the prevalence of bruxism. This situation indicates a substantial information gap. The Basic Health Research Riskesdas (2018b) report recorded a prevalence of mild emotional mental disorders in Aceh of 9.4%; however, it did not examine their association with physical conditions such as bruxism. In this context, occupational groups such as police personnel warrant particular attention because they may experience high levels of occupational stress due to demanding workloads, exposure to hazardous situations, social conflicts, and shift work schedules that may disrupt normal sleep cycles.

Among personnel at the Banda Aceh City Police Department, high workloads, psychological challenges associated with dealing with conflict or criminal situations, and limited attention to mental health may represent potential risk factors for bruxism (Carvalho, Cury, & Garcia, 2022). To date, no study in Aceh has specifically examined the association between anxiety levels and bruxism among police personnel. This constitutes a clear research gap that warrants further investigation.

The novelty of this study lies in its examination of the association between anxiety levels and bruxism among police personnel in Aceh, while also assessing the involvement of other factors, including family history, length of service, occupational stress, sleep quality, physical activity, smoking habits, and medication use. This study is expected to contribute to the scientific literature and may provide a basis for preventive interventions, such as stress management programs, sleep disorder screening, and oral and mental health education within the police work environment.

## **METHOD**

This study employed a quantitative approach with a cross-sectional design to analyze the associations of anxiety, occupational stress, sleep quality, family history, medication use, smoking behavior, physical activity, age, sex, and length of employment with sleep bruxism among police personnel at the Banda Aceh City Police Department. The study was conducted at the Banda Aceh City Police Department, located on Kampung Baru Street, Baiturrahman District, Banda Aceh City, Aceh, the study was conducted from January 22 to 31, 2026. The study population consisted of all active police personnel at the Banda Aceh City Police Department, totaling 573 personnel. Sampling was conducted using a total sampling method, in which all population members who met the study criteria were included as respondents. The inclusion criteria were personnel who were willing to participate by providing informed consent, actively serving at the Banda Aceh City Police Department, aged 20-50 years, and having at least one year of service. The exclusion criteria included personnel who were on extended leave, sick leave, maternity leave, or were not on duty during the data collection period.

The study used primary data collected through a structured questionnaire administered via Google Forms. The research instruments consisted of a respondent characteristics questionnaire and instruments for measuring the study variables. Sleep bruxism was assessed using the Subject-Based Assessment (SBA) developed by Winocur, Littner, Adams, Gavish, and Endodontology (2006) and used in sleep bruxism research by Manfredini and Lobbezoo (2009). Anxiety was assessed using the Generalized Anxiety Disorder-7 (GAD-7) developed by Spitzer, Kroenke, Williams, and Löwe (2006), Occupational stress was measured using the Perceived Stress Scale (PSS) developed by Cohen (1988), while sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI) developed by Buysse, Reynolds III, Monk, Berman, and Kupfer (1989). Smoking behavior was assessed using a questionnaire based on the Riskesdas (2018a), whereas physical activity was assessed using the Global Physical Activity Questionnaire (GPAQ) based on the WHO GPAQ Analysis Guide WHO (2016). Length of employment was obtained from the respondent characteristics questionnaire and categorized as short-term employment (<5 years) and long-term employment (≥5 years). Information on family history and medication use was obtained through

structured questions in the research questionnaire. Sleep bruxism was categorized based on the instrument score into participants without sleep bruxism and those with sleep bruxism according to the cut-off point established in the study. Sleep quality was categorized as good sleep quality (score  $\leq 5$ ) and poor sleep quality (score 6-21), while physical activity was categorized into low, moderate, and high levels based on total MET-min/week.

The data were analyzed using StataMP-17 through univariate analysis, logistic regression, and multiple logistic regression. Univariate analysis was used to present the frequency and percentage distributions of the study variables. Logistic regression was performed to examine the association between each independent variable and sleep bruxism and to obtain odds ratios (ORs), 95% confidence intervals (95% CIs), and p-values. Variables with p-values  $< 0.25$  in the bivariate analysis, along with variables considered theoretically relevant, were included in the multiple logistic regression model. The final model was used to identify the factor most strongly associated with sleep bruxism and was presented as adjusted odds ratios (AORs), 95% CIs, and p-values, with a significance level of  $\alpha = 0.05$ . The study received ethical approval from the Health Polytechnic of the Ministry of Health of Aceh Research Ethics Committee (Poltekkes Kemenkes Aceh), approval number DP.04.03/12.7/041/2026. All---respondents provided informed consent before data collection.

## RESULT

Table 1.  
Respondent characteristics (n= 573)

| Respondent characteristics | f   | %     |
|----------------------------|-----|-------|
| Age                        |     |       |
| Young adults (20-39)       | 392 | 57.42 |
| Middle-age adults (40-59)  | 244 | 42.58 |
| Sex                        |     |       |
| Female                     | 77  | 13.44 |
| Male                       | 496 | 86.56 |
| Position                   |     |       |
| PNS                        | 7   | 1.22  |
| Bintara                    | 523 | 91.27 |
| Perwira                    | 43  | 7.50  |
| Marital Status             |     |       |
| Unmarried                  | 63  | 10.99 |
| Married                    | 510 | 89.01 |
| Work Unit                  |     |       |
| Low Risk                   | 67  | 11.69 |
| Moderate Risk              | 131 | 22.86 |
| High Risk                  | 375 | 65.45 |

Table 1, the majority of respondents were young adults aged 20-39 years 57.42%, male 86.56%, and Bintara 91.27%. Most respondents were married 89.01%, and the majority worked in high-risk units 65.45%, followed by moderate-risk 22.86% and low-risk units 11.69%.

Table 2.  
Analysis of Factors Associated with Sleep Bruxism Using Logistic Regression Analysis

| Variable          | Sleep Bruxism |       |     |       | OR    | 95% CI     | p-value |
|-------------------|---------------|-------|-----|-------|-------|------------|---------|
|                   | Yes           |       | No  |       |       |            |         |
|                   | f             | %     | f   | %     |       |            |         |
| Anxiety           |               |       |     |       |       |            |         |
| Low               | 87            | 24.65 | 266 | 73.35 |       |            |         |
| Moderate          | 55            | 50.93 | 53  | 49.07 | 3.17  | 2.02-4.96  | 0.001   |
| High              | 66            | 58.93 | 46  | 41.07 | 4.38  | 2.80-6.86  | 0.001   |
| Work Stress       |               |       |     |       |       |            |         |
| Low               | 104           | 30.41 | 238 | 69.59 |       |            |         |
| Moderate          | 104           | 45.02 | 127 | 54.98 | 1.87  | 1.32-2.65  | 0.001   |
| Sleep Quality     |               |       |     |       |       |            |         |
| Good              | 86            | 29.97 | 201 | 70.03 |       |            |         |
| Poor              | 122           | 42.66 | 164 | 57.34 | 1.73  | 1.23-2.45  | 0.002   |
| Family History    |               |       |     |       |       |            |         |
| No                | 20            | 8.23  | 223 | 91.77 |       |            |         |
| Yes               | 188           | 56.97 | 142 | 43.03 | 14.76 | 8.89-24,50 | 0.001   |
| Medication Use    |               |       |     |       |       |            |         |
| No                | 153           | 32.62 | 316 | 67.38 |       |            |         |
| Yes               | 55            | 52.88 | 49  | 47.12 | 2.31  | 1.50-3.56  | 0.001   |
| Smoking Behavior  |               |       |     |       |       |            |         |
| Non-Smoker        | 46            | 34.07 | 89  | 65.93 |       |            |         |
| Smoker            | 162           | 36.99 | 276 | 63.01 | 1.13  | 0.75-1.70  | 0.539   |
| Physical Activity |               |       |     |       |       |            |         |
| Low               | 17            | 41.46 | 24  | 58.54 |       |            |         |
| Moderate          | 75            | 34.72 | 141 | 65.28 | 0.75  | 0.37-1.48  | 0.410   |
| High              | 166           | 36.71 | 200 | 63.29 | 0.81  | 0.42-1.58  | 0.554   |
| Length of Working |               |       |     |       |       |            |         |
| New               | 19            | 27.94 | 49  | 72.06 |       |            |         |
| Long              | 189           | 37.43 | 316 | 62.57 | 2.53  | 1.31-4.88  | 0.005   |

Table 3, the most dominant factor associated with sleep bruxism was family history, with respondents who had a family history of sleep bruxism showing 13.38 times higher odds of experiencing sleep bruxism compared with those without a family history (AOR=13.38; 95% CI: 7.83-22.85;  $p=0.001$ ). The Pseudo  $R^2$  value of 0.3170 indicates that the model explained approximately 31.70% of the variation in sleep bruxism, while the remaining 68.30% may be attributed to other factors not included in the model.

Table 2, anxiety was significantly associated with sleep bruxism. Respondents with moderate anxiety had 3.17 times higher odds of experiencing sleep bruxism than those with low anxiety (OR=3.17; 95% CI: 2.02-4.96;  $p=0.001$ ), while those with high anxiety had 4.38 times higher odds (OR=4.38; 95% CI: 2.80-6.86;  $p=0.001$ ). Moderate work stress was also significantly associated with sleep bruxism, with respondents having 1.87 times higher odds compared with those with low work stress (OR=1.87; 95% CI: 1.32-2.65;  $p=0.001$ ). Poor sleep quality was associated with 1.73 times higher odds of sleep bruxism compared with good sleep quality (OR=1.73; 95% CI: 1.23-2.45;  $p=0.002$ ). Family history showed the strongest association, as respondents with a family history of sleep bruxism had 14.76 times higher odds of experiencing sleep bruxism than those without a family history (OR=14.76; 95% CI: 8.89-24.50;  $p=0.001$ ). Medication use was also significantly associated with sleep bruxism, with users having 2.31 times higher odds than non-users (OR=2.31; 95% CI: 1.50-3.56;  $p=0.001$ ). In contrast, smoking behavior and physical activity were not significantly associated with sleep bruxism ( $p>0.05$ ).

Table 3.

## Analysis of Factors Associated with Sleep Bruxism Using Multiple Logistic Regression Analysis

| Variable              | AOR (95% CI)       | p-value |
|-----------------------|--------------------|---------|
| Anxiety               |                    |         |
| Low                   |                    |         |
| Moderate              | 3.25 (1.84-5.74)   | 0.001   |
| High                  | 4.32 (2.47-7.57)   | 0.001   |
| Work Stress           |                    |         |
| Moderate              |                    |         |
| High                  | 1.58 (2.47-7.57)   | 0.041   |
| Sleep Quality         |                    |         |
| Good                  |                    |         |
| Poor                  | 2.30 (1.47-3.58)   | 0.001   |
| Family History        |                    |         |
| No                    |                    |         |
| Yes                   | 13.38 (7.83-22.85) | 0.001   |
| Medication Use        |                    |         |
| No                    | 2.02 (1.18-3.47)   | 0.010   |
| Yes                   |                    |         |
| Smoking Behavior      |                    |         |
| Non- Smoker           |                    |         |
| Smoker                | 1.17 (0.76-1.81)   | 0.463   |
| Physical Activity     |                    |         |
| Low                   |                    |         |
| Moderate              | 0.62 (0.25-1.52)   | 0.303   |
| High                  | 0.75 (0.31-1.80)   | 0.529   |
| Length of Working     |                    |         |
| New                   |                    |         |
| Long                  | 5.30 (2.45-11.45)  | 0.001   |
| Pseudo R <sup>2</sup> | 0.3170             |         |

**DISCUSSION**

Based on the findings of this study, police personnel who experienced sleep bruxism were more frequently found among those with higher levels of anxiety. This finding indicates that anxiety is a psychological condition that plays an important role in increasing vulnerability to sleep bruxism and was the most dominant factor identified in this study. Psychophysiologically, anxiety may maintain a state of hyperarousal, causing individuals to remain alert and experience difficulty achieving optimal relaxation during sleep. This condition may increase micro-arousals and sympathetic nervous system activity, which subsequently affects masticatory muscle activity. Among police personnel, this condition may be associated with high demands for vigilance, unpredictable work situations, responsibility for safety, and pressures related to the performance of their duties.

These findings are consistent with Büyüknalbant, Aydınbelge, Sarı, and Demir (2025), who reported an association between anxiety and sleep bruxism, and with Turcio et al. (2022), who found an association between anxiety and bruxism among workers. Priscila Brenner Hilgenberg-Sydney et al. (2024), also explained that psychological factors such as anxiety may be associated with muscle tension and parafunctional activity. The consistency of these findings strengthens the assumption that anxiety is not merely a condition that co-occurs with sleep bruxism but may be part of the mechanism triggering jaw motor activity during sleep. Thus, the predominance of anxiety in this study contributes to the understanding that psychological factors require greater attention in explaining sleep bruxism among personnel working under high-pressure conditions.

Work-related stress in this study can be interpreted as a condition that intensifies the psychophysiological burden experienced by police personnel. Pressure arising from job demands, exposure to risky situations, work responsibilities, and irregular work patterns may sustain the stress response over an extended period. Persistent stress activation may increase sympathetic nervous

system activity, disrupt sleep stability, and increase the likelihood of micro-arousals associated with masticatory muscle activity. This finding is consistent with I. A. Pavlou, D. A. Spandidos, V. Zoumpourlis, and V. K. J. B. R. Papakosta (2024), who demonstrated an association between aspects of occupational stress and sleep bruxism, and Lecor et al. (2023), who explained that psychological stress may affect sleep–wake mechanisms and exacerbate bruxism. However, the lower prominence of work-related stress compared with anxiety suggests that occupational pressure may not operate simply as a direct cause. Work-related stress may serve as a source of pressure that subsequently develops into a psychological response in the form of anxiety; therefore, its influence on sleep bruxism may occur through interconnected mechanisms.

Sleep quality may provide an explanation of the physiological conditions that allow sleep bruxism to occur. Suboptimal sleep may lead to sleep fragmentation and instability in transitions between sleep stages, thereby increasing micro-arousals. These changes may be accompanied by involuntary motor activity of the masticatory muscles and facilitate the occurrence of sleep bruxism. This explanation is consistent with Thomas et al. (2024), who demonstrated that individuals with bruxism tend to have poorer sleep quality, and Mulya, Rikmasari, and Novianti (2024), who identified sleep-related problems among individuals with sleep bruxism. Among police personnel, these conditions may be associated with occupational demands and irregular work patterns. In addition, anxiety and work-related stress may further impair sleep stability, suggesting that these three conditions may form an interconnected psychophysiological sequence that reinforces vulnerability to sleep bruxism.

In contrast to psychological and sleep-related factors, physical activity in this study did not demonstrate a significant role in sleep bruxism. This finding is consistent with Carrillo-Diaz, Ortega-Martínez, Romero-Maroto, and González-Olmo (2022), who found no association between physical activity and either sleep bruxism or awake bruxism. Priscila Brenner Hilgenberg-Sydney et al. (2024), also indicated that evidence regarding the relationship between physical activity and bruxism remains inconsistent. This difference may be explained by the fact that physical activity does not directly regulate the mechanisms of micro-arousals and orofacial motor activity during sleep. Although physical activity may help reduce stress and support sleep quality, these benefits may be indirect and may not necessarily result in changes in the specific mechanisms underlying sleep bruxism. Therefore, among police personnel, the influence of physical activity may become less apparent when compared with psychological stressors and sleep conditions.

Similarly, smoking behavior did not demonstrate a significant role in sleep bruxism. This finding is consistent with Orzeszek et al. (2025), but differs from Frosztega et al. (2022), who reported a higher intensity of bruxism among smokers. These differences suggest that the influence of smoking on sleep bruxism has not yet demonstrated a consistent pattern. Nicotine may increase sympathetic nervous system activity and affect sleep patterns; however, these effects may not directly result in bruxism activity. The influence of smoking may be affected by psychological factors, sleep quality, the amount and duration of nicotine exposure, and individual characteristics. In the police population, psychological pressure arising from occupational demands may have a stronger influence, making the direct relationship between smoking behavior and sleep bruxism less apparent.

Overall, the findings of this study indicate that sleep bruxism among police personnel is more closely associated with psychophysiological mechanisms, particularly anxiety, work-related stress, and sleep conditions, than with physical activity and smoking behavior. Anxiety, as the most dominant factor, reinforces the understanding that psychological responses to stress play an important role in the development of sleep bruxism activity. The Pseudo  $R^2$  value of 0.1012 indicates that the factors included in the model explain only a portion of the variation in sleep bruxism, suggesting that other factors not included in the study may also contribute to its

occurrence. These findings contribute to the understanding of sleep bruxism among police personnel by highlighting psychological conditions as an important aspect that should be considered alongside sleep-related factors and occupational characteristics when explaining the occurrence of this condition.

## CONCLUSION

This study demonstrates that sleep bruxism among police personnel is primarily associated with psychological factors and sleep conditions. Anxiety was the most dominant factor, while work stress and sleep quality also contributed to increased susceptibility to sleep bruxism. In contrast, physical activity and smoking behavior did not show significant associations. These findings indicate that sleep bruxism among police personnel should not only be understood as a motor activity disorder during sleep, but also as a condition associated with psychological responses to occupational stress and sleep stability.

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