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The Relationship Between Insomnia and Suicidal Behavior in Adolescents at SMAN 11 Mataram

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Abstract: Adolescence is a vulnerable period for mental health problems, including suicidal behavior. Insomnia is frequently experienced by adolescents and may be associated with emotional dysregulation and psychological distress. This intention of this study was to analyze relationship between insomnia and suicidal behavior among adolescents at SMAN 11 Mataram. This analytical observational study used a cross-sectional design involving 89 students of SMAN 11 Mataram. The sample size was determined using the Slovin from a population of 113 students with a 5% margin of error. Sampling was conducted using stratified random sampling based on grade level: grade 10(29 students), grade 11(36 students), and grade 12(48 students), with proportional random selection resulting in 23, 28, and 37 students, respectively. Data were collected using the validated Indonesian version of the Insomnia Severity Index (ISI) and Suicide Behaviors Questionnaire-Revised (SBQ-R). Insomnia was categorized based on ISI score ≥10, while suicidal behavior risk was identified using SBQ-R score ≥7. Reliability analysis showed Cronbach's alpha values of 0.750 for ISI and 0.896 for SBQ-R.Spearman's rank correlation test showed a significant association between insomnia and suicidal behavior ($r = 0.229$; $p = 0.031$). It was concluded there is a positive association between insomnia and suicidal with a weak correlation.

Keywords: Adolescents; Cross-sectional study; Insomnia; Suicidal behavior.

Introduction

The World Health Organization (WHO) defines adolescence as a transitional phase between childhood and adulthood, encompassing individuals aged 10 to 19 years. This phase is characterized by various biological and psychosocial changes that can significantly impact daily activity patterns. The WHO estimates that the number of adolescents worldwide currently reaches approximately 1.3 billion, or approximately 16 percent of the total global population (WHO, 2024). Meanwhile, in Indonesia, data from the Badan Pusat Statistik (BPS) in 2023 showed that the 15–19 age group reached 22.13 million, consisting of 11.42 million males and 10.71 million females (BPS, 2023). With its complex developmental dynamics, adolescence is a vulnerable period for some individuals, and this vulnerability may be associated with the emergence of suicidal ideation (Aulia et al., 2020).

Suicide is defined as an intentional act of self-harm that results in a fatal outcome, with the intent of death (SAMHSA, 2020). Suicidal behaviors can be categorized into several terms: suicidal ideation, suicidal plan, suicidal attempt, and self-harm (Anjani et al., 2023). Suicide is a serious public health problem in the modern era. Data shows that approximately 800,000 people commit suicide each year worldwide (An et al., 2023). Globally, suicide ranks third as the leading cause of death in the 15-29 age group (WHO, 2025). Based on national police data, the number of suicide cases in Indonesia recorded in 2023 reached 1,350. This figure represents an increase compared to the previous year, which recorded 826 cases. Medical records from the Mutiara Sukma Mental Hospital (RSJMS) in West Nusa Tenggara Province show that the number of patients diagnosed with suicidal behavior

fluctuated between 2023 and 2025. In 2023, 113 cases were recorded, consisting of 41 outpatient cases and 72 inpatient cases. This number increased in 2024 to 176 cases, with 96 outpatient cases and 80 inpatient cases. However, in 2025, the number of cases decreased to 70 cases, consisting of 42 outpatient cases and 28 inpatient cases. Given this high prevalence, it is important to examine factors that can increase the risk of suicidal behavior in adolescents, one of which is sleep disorders such as insomnia.

Insomnia is a sleep condition marked by challenges in starting or sustaining sleep. Individuals with insomnia frequently struggle to fall asleep, may awaken during the night, or rise too early in the morning. This condition is often experienced by adolescents and can significantly impact their physical and mental health, and quality of life (Bimantara & Pitayanti, 2024). According to the Sleep Foundation (2020), The occurrence of insomnia globally affected 67% of 1,508 individuals from Southeast Asia, with 23.8% of cases occurring among adolescents. Insomnia affects around 10% of adolescents in Indonesia, which translates to nearly 28 million individuals (Zurrahmi et al., 2022). People with insomnia typically feel intense fear during the day and have difficulty sleeping at night. This sleep disorder can negatively impact daily life, such as lowering the immune system, making them more susceptible to disease, affecting emotional stability, and disrupting daily activities (Fauzan & Supratman, 2023).

Sleep disorders such as insomnia can increase the risk of suicide in adolescents, even after accounting for mood disorders. A survey of 10,123 adolescents found that those with insomnia had a higher risk of suicidal thoughts, plans, and attempts compared to those without insomnia. The effect of insomnia on suicide may occur because insomnia affects the body's systems that regulate arousal, emotion, brain reward, and decision-making (Uccella et al., 2023).

Research conducted by Kevin G. Saulnier found that individuals with insomnia and short sleep duration had a 2.09-fold increased risk of suicide (Saulnier et al., 2022). Another study by Zixuan Guo found that insomnia triggers suicidal ideation through nightmares and depression as mediators, although relatively weak, but still significant (Guo et al., 2024). Ran Wu also conducted research that the length of insomnia symptoms can predict suicidal thoughts, and after accounting for depressive symptoms, insomnia can also predict deaths resulting from suicide attempts and/or suicide after trying to control depression symptomps. (Wu et al., 2022). Meanwhile, research conducted by Irgy Prijenka Ardhanariswara have shown that sleep disturbances are not associated with suicidal ideation. Data analysis using Fisher's exact test yielded a p-value of 0.608, indicating no statistically significant relationship between sleep disturbances and suicidal ideation (Ardhanariswara & Samira, 2022).

The global health crisis is characterized by rising suicide rates worldwide (Saulnier et al., 2022). One factor that potentially influences suicidal behavior is insomnia (Guo et al., 2024). However, the relationship between the two has never been specifically studied in adolescents at SMAN 11 Mataram. Amanullah's (2025) study on insomnia in adolescents in Mataram City, involving several high schools, including SMAN 11 Mataram, showed that this school had the highest prevalence of insomnia compared to other schools, at 28.26% (Amanullah et al., 2025). This was the basis for selecting the location for this study. The urgency of this research is further strengthened by medical records from the Mutiara Sukma Mental Hospital (RSJMS) in West Nusa Tenggara Province, which recorded 113 cases of suicidal behavior in 2023, increasing to 176 cases in 2024, and although decreasing to 70 cases in 2025, this number still indicates a high incidence. This fact emphasizes the need to identify risk factors such as insomnia that have the potential to trigger suicidal behavior, especially in adolescents.

Materials and Methods

This research is an observational analytical study using a cross-sectional design. It aims to analyze the relationship between insomnia and suicidal behavior in adolescents at SMAN 11 Mataram. The population in this study were adolescents attending at Sekolah Menengah

Atas (SMA) in Mataram City. The accessible population for this study was adolescents attending SMAN 11 Mataram. The sampling method utilized in this research was chosen based on the variation of population characteristics, therefore a probability sampling method with stratified random sampling was used. This method was implemented by dividing the population into several strata, which in this study were grouped by grade level, namely grades 10, 11, and 12. After the strata were divided, samples from each stratum were taken randomly and proportionally according to the required number. A total of 88 respondents participated in this study. The distribution of each stratum was as follows: 23 students in grade 10, 28 students in grade 11, and 37 students in grade 12. The independent variable was insomnia, measured using the Insomnia Severity Index while the dependent variable was suicidal behavior, determined using Suicide Behaviors Questionnaire-Revised (SBQ-R), a questionnaire that had previously undergone validity and reliability testing.

First, we conducted an ethics hearing with the ethics committee to obtain ethical approval. After obtaining ethical approval, we could begin data collection while adhering to ethical principles. Participants and their parents or guardians were provided with details about the study's intention, methods, possible risks, and advantages. Parental consent in writing and adolescent agreement were secured before taking part. The confidentiality and privacy of respondents were preserved by utilizing coded data devoid of personal identifiers, and all gathered information was only available to the research team. Due to the sensitive nature of suicidal behavior assessment, a crisis referral protocol was prepared. Participants identified as having potential suicide risk based on SBQ-R results or expressing suicidal concerns were provided with appropriate psychological support and referred to available mental health services for further evaluation and management.

Data on insomnia and suicidal behavior were collected using the Insomnia Severity Index (ISI) and the Suicide Behaviors Questionnaire-Revised (SBQ-R). Data collection was conducted by distributing questionnaires to high school students at SMAN 11 Mataram. Prior to data collection, the researcher provided informed consent to ensure that participants understood the purpose and content of the questionnaire, understood the procedures for completing it, and agreed to participate in the study. This study used primary data obtained directly through respondents' completion of the questionnaire. The gathered data were subsequently examined with the data processing software Statistical Product and Service Solutions (SPSS). A univariate analysis was performed to detail the attributes of the participants. Statistical analyses were conducted to examine the connections between variables.

Results and Discussion

Univariate Analyze

An observational longitudinal study in China demonstrated that insomnia is a contributing factor to an increased risk of later suicidal attempts, regardless of demographic variables and other clinical conditions. This discovery is reinforced by modern theories showing a reliable connection between sleep issues and suicidal inclinations. Insomnia has been recognized as a standalone risk factor for suicidal thoughts, attempts, and even fatal suicides (Lu et al., 2024). Based on the results of the frequency distribution of the insomnia severity index, the findings are presented as follows.

Table 1. Insomnia

Insomnia	Frequency	
	n	%
Not Experiencing insomnia	40	44.9
Subclinical	41	46.1
Moderate Clinical	7	7.9
Severe Clinical	1	1.1

Table 2. Suicide Behaviors

Suicide Behaviors	Frequency	
	n	%
Low Risk	73	82.0
High Risk	16	18.0

The results of filling out the Insomnia Severity Index (ISI) questionnaire are presented in Table 1, which shows that most respondents were in the subclinical insomnia category and did not experience insomnia, with a relatively small difference, namely 46.1% in the subclinical

insomnia category and 44.9% in the non-insomnia category.

Table 2 presents the distribution of suicidal behavior categories based on the results of the Suicide Behaviors Questionnaire-Revised (SBQ-R). Based on the table, the majority of respondents were in the low-risk suicidal behavior category, namely 73 respondents (82.0%), while 16 respondents (18.0%) were in the high-risk suicidal behavior category, thus requiring further attention and vigilance.

Bivariate Analyze

The analysis of the relationship between insomnia and suicidal behavior in adolescents in this study was conducted using the Spearman correlation test. The selection of this nonparametric test was based on the results of the normality test which showed that the data were not normally distributed with a significance value of $p < 0.05$, and because the variables analyzed were measured using an ordinal scale. The results of grouping data between insomnia levels and suicide risk categories showed a tendency for an increase in the proportion of high suicide risk as the severity of insomnia increased. The results of the Spearman correlation test showed a value of $r = 0.229$ with $p = 0.031$ ($p < 0.05$), which indicates a positive relationship with a weak and statistically significant correlation strength between insomnia and suicidal behavior in adolescents.

Table 3. Bivariate Results of the Relationship between Insomnia and Suicidal Behavior in Adolescents at SMAN 11 Mataram

Insomnia	Suicidal Behavior						*p-value*	rs
	High Risk		Moderate Risk		Total			
	n	%	n	%	N	%		
Severe Clinical	1	100.0	0	0.0	1	100.0		
Moderate Clinical	4	57.1	3	42.9	7	100.0		
Subclinical	6	14.6	35	85.4	41	100.0		
No Insomnia	5	12.5	35	87.5	40	100.0		
Total	16	18.0	73	82.0	89	100.0	0.031	0.229

Bivariate Analysis of the Relationship between Insomnia and Suicidal Behavior in Adolescents at SMAN 11 Mataram

This study aims to analyze the relationship between insomnia and suicidal behavior in adolescents at SMAN 11 Mataram. Data were collected using the Insomnia Severity Index (ISI) questionnaire to measure insomnia levels and the Suicide Behaviors Questionnaire-Revised (SBQ-R) to measure suicidal behavior. The results of the Spearman correlation analysis showed a significant relationship between insomnia and suicidal behavior in adolescents ($r = 0.229$; $p = 0.031$). This finding indicates that the higher the level of insomnia experienced by adolescents, the more likely it is followed by an increase in suicidal behavior scores, although the strength of the relationship obtained is relatively weak.

The findings of this study align with a meta-analysis conducted by Baldini et al. (2024), which found that insomnia is the sleep disorder most frequently connected with suicidal behavior, including suicidal thoughts, suicide attempts, and suicide deaths. Similar results were also reported by Harris et al. (2020), who showed that sleep disturbances, particularly insomnia, are consistently associated with an increased risk of suicidal thoughts and behavior. Furthermore, research by Wu et al. (2022) found that the severity of sleep disturbances is associated with increased suicidal ideation, further strengthening the evidence for a link between sleep disturbances and suicidal behavior in adolescents.

The results of this study indicate a link between insomnia and suicidal behavior in adolescents. These findings can be explained by several psychological and neurobiological mechanisms. Persistent sleep disturbances, particularly repeated nighttime awakenings, have the potential to impair cognitive function in the frontal lobe, which plays a role in decision-making, impulse control, and risk assessment. This condition causes individuals to become more impulsive and less able to consider the consequences of their behavior. Insomnia also impacts concentration, working memory, and emotional regulation, making adolescents more

susceptible to persistent negative thoughts and feelings of hopelessness. Neurobiologically, insomnia increases fatigue and daytime sleepiness, which are associated with impaired neurotransmitter regulation, particularly serotonin in the prefrontal cortex, which plays a key role in mood regulation and self-harm behavior. Sleep disturbances can also exacerbate emotional stress and reduce feelings of well-being and daily functioning, leaving individuals feeling helpless in the face of challenges. The combination of cognitive dysfunction, neurobiological imbalance, and decreased coping skills suggests that insomnia acts as a risk factor that can directly increase vulnerability to suicidal behavior (Lu et al., 2024).

However, the results of this study do not entirely align with research (Chusnah & Widiyawati, 2025) conducted on high school students in Gresik. This study showed that adolescents with good or poor sleep patterns did not have high suicidal ideation rates, and statistical tests showed no significant relationship between sleep patterns and suicidal ideation (p-value = 0.91). This difference in results may be influenced by differences in respondent characteristics, the instruments used to measure sleep disturbances and suicidal ideation, and other psychosocial factors not analyzed in depth. This suggests that the relationship between insomnia and suicidal behavior in adolescents is complex and influenced by various factors.

Overall, the results of this study confirm that insomnia is associated with suicidal behavior in adolescents, although the relationship found is relatively weak. Adolescents with sleep disturbances tend to have higher psychological vulnerability, potentially increasing the risk of suicidal behavior. Insomnia can also be a symptom of other mental disorders that carry a high risk of suicide, such as depression, so its association with other mental disorders needs to be considered. Insomnia cannot be viewed as the sole cause, but rather as a contributing factor. Therefore, attention to adolescent sleep quality is a crucial part of efforts to prevent mental health issues in the school environment.

This study contributes by presenting a picture of the relationship between insomnia and suicidal behavior in adolescents at SMAN 11 Mataram, a topic that has been limitedly studied, particularly in Mataram City. The findings of this study can serve as a starting point for further research examining other factors related to sleep disorders and the risk of suicidal behavior in adolescents. However, this study has limitations, including the inability to control for other factors that may influence suicidal behavior, such as anxiety, depression, psychological stress, bullying experiences, and other psychosocial factors. Furthermore, the cross-sectional study design limits the researchers' ability to draw conclusions about the causal relationship between insomnia and suicidal behavior.

Conclusion

Based on the results of the research that has been conducted, it can be concluded that the majority of students at SMAN 11 Mataram are in the subclinical insomnia symptom category. In addition, the majority of respondents are included in the low risk category of suicidal behavior compared to the high risk category of suicidal behavior. The results of the statistical analysis also showed a p value = 0.031 ($p < 0.05$) and $r = 0.229$, which means there is a positive relationship with a weak correlation strength between insomnia and suicidal behavior in adolescents at SMAN 11 Mataram.

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