



The Relationship between *Sleep Hygiene* and Sleep Disorders in Elementary School Age Children in Grades 5-6 at Sdn 11 Telaga Biru, Gorontalo Regency

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ABSTRACT

Sleep is a fundamental physiological process for the recovery of body organs and the optimization of children's cognitive function. However, many children experience sleep disorders, which are conditions that disrupt normal sleep patterns, both in terms of duration, quality, and sleep time. One of the triggers is poor sleep hygiene, which is a series of behavioral habits and environmental settings designed to support healthy sleep. This study aims to analyze the relationship between sleep hygiene and sleep disorders in students in grades 5-6 at SDN 11 Telaga Biru. The study used a quantitative method with a cross-sectional design involving 44 students as a sample (total sampling). Data were collected using the Sleep Hygiene Index (SHI) and Sleep Disturbance Scale For Children (SDSC) questionnaires, then analyzed bivariate using the Fisher's Exact Test. The findings showed that the majority of respondents had moderate hygiene (50%) and experienced severe sleep disorders (59.1%). The results of the statistical test obtained a p-value of 0.000 ($p < 0.05$), which proves that there is a significant relationship between sleep hygiene and sleep disorders. The worse the implementation of healthy sleep habits, the higher the risk of children experiencing severe sleep disorders. There is a real link between daily sleep behavior and the appearance of sleep disorders in children.

INTRODUCTION

Sleep is a basic need that plays an important role in supporting physical, psychological, emotional control, and cognitive development of elementary school-age children. Optimal sleep needs contribute to children's learning abilities, concentration, and emotional stability. Children aged 6-13 years need about 10-11 hours of sleep per day so that the growth and development process can take place optimally. On the other hand, sleep deprivation can have various negative impacts such as decreased concentration, increased stress, health problems, and weakened memory. (Jannah & Hidajat, 2024) (Suri & Soleha, 2023)

Sleep disorders in children and adolescents are conditions characterized by disturbances in the duration, quality, and timing of sleep, with a reported high prevalence in school-age and adolescents, ranging from 20-40%, making it a significant public health problem. Recent scientific evidence suggests that chronic sleep disorders are closely related to learning process inhibitions, decreased memory and attention function, and decreased academic performance in children. In addition, poor sleep quality is also associated with disturbances in emotional and behavioral regulation, including mood swings, difficulty focusing, hyperactivity, impulsivity, and increased aggressive behavior in children and adolescents. (Ogundele & Yemula, 2022) (J. Liu et al., 2022)

Globally, *the World Health Organization* (WHO) emphasizes that sleep disorders and problems in preschool children are common health issues and have a wide impact on children's growth and development, especially characterized by frequent awakenings at night and sleep continuity disorders. In line with this, a recent national population study in China reported that about 30-35% of preschoolers experience sleep disturbances, with the main complaints being difficulty maintaining sleep and waking up repeatedly at night. In Japan and other Asian countries, cutting-edge research has also shown that sleep disorders such as difficulty starting sleep and excessive daytime sleepiness are still commonly found in school-age children, with clinically significant prevalence. Meanwhile, in Indonesia, recent research shows that sleep disorders remain a significant problem in children, with a high prevalence especially in primary school age, related to factors of sleep habits and family environment. (Hua et al., 2022) (Sakata et al., 2025) (Isnaini A. et al., 2025)

Based on data from the Indonesian Ministry of Health, the prevalence of sleep disorders in preschool-age children in Indonesia reached 44.2%. Riskesdas 2018 also showed that there are mental emotional disorders in children and adolescents in Gorontalo Province with a prevalence of 10.3% to 17.7%. Although the data did not specifically describe sleep disorders in elementary school-aged children, this condition indicates the presence of psychological problems that are potentially related to sleep disorders.

Research in Gorontalo shows that 60% of adolescents experience poor sleep quality due to excessive use of gadgets and irregular sleep patterns. These findings indicate that sleep problems may also occur in elementary school-age children, but until now research that specifically examines sleep disorders in this age group in the Gorontalo region is still very limited. (Fikri et al., 2023)

One of the important factors that play a role in the occurrence of sleep disorders is unhealthy sleep habits or *sleep hygiene*. Sleep hygiene is a non-pharmacological approach that emphasizes the formation of habits and routines before bed to improve sleep quality and duration. Sleep hygiene components include consistency of sleep and wake times, limiting caffeine consumption, routines before bed, avoiding the use of gadgets, and creating a comfortable sleep environment. (Suri & Soleha, 2023) (Kurniawati & Herwanto, 2021)

Various studies show that the application of *sleep hygiene* has a significant influence on improving the quality of children's sleep. *Sleep hygiene interventions* carried out in a structured manner have been proven to be able to improve sleep duration, sleep efficiency, and sleep behavior in school-age children. A *randomized controlled trial* study showed that school-based Koinis-Mitchell et al., (2023) *sleep hygiene* programs significantly improved sleep duration and reduced sleep behavior problems compared to the control group. Similar findings were reported by those who stated that the application of Amaral et al., (2024) *sleep hygiene combined* with relaxation routines was effective in reducing nighttime sleep disturbances and improving the continuity and quality of children's sleep. Although empirical evidence shows the effectiveness of *sleep hygiene* on children's sleep quality, most of the research is still conducted outside the Indonesian context, so studies examining the application of *sleep hygiene* in elementary school children in the local context, especially in Gorontalo Regency, are still limited and need to be further developed.

An initial survey conducted on August 29, 2025 at SDN 11 Telaga Biru showed that most students in grades 5 and 6 had a habit of sleeping late, namely 22.00-24.00, even until 02.00-03.00 in the morning. The children only sleep about 7-8 hours per day, lower than the ideal requirement. Interviews with parents revealed that the use of gadgets before bed and the habit of sleeping with parents are still common, which indicates poor sleep hygiene.

Based on this description, as well as the lack of similar research at SDN 11 Telaga Biru, Gorontalo Regency, the researcher is interested in studying the relationship between sleep hygiene and sleep disorders in elementary school children in grades 5-6 at SDN 11 Telaga Biru, Gorontalo Regency. To find out the relationship between sleep hygiene and sleep disorders in elementary school age children at SDN 11 Telaga Biru, Gorontalo Regency.

RESEARCH METHODS

This study is a quantitative research with a correlational design using a *cross-sectional* approach. The study aims to analyze the relationship between *sleep hygiene* and sleep disorders in elementary school-age children. Data collection is carried out at a specific time without intervention, allowing simultaneous measurement of relationships between variables.

The research was carried out at SDN 11 Telaga Biru, Gorontalo Regency on November 5-10, 2025. The research population was all 5th and 6th grade students totaling 44 children. The sampling technique used is *total sampling*, where all members of the population are used as research samples, so that the number of samples is equal to the number of populations.

Sleep disturbance measurement in children is carried out using *the Sleep Disturbance Scale for Children* (SDSC), which is a standard instrument widely used to assess various dimensions of sleep disturbances in pediatric populations. The SDSC consists of 26 questions covering six domains of child sleep disorders and produces a total score ranging from 26-130, where a score of ≥ 65 indicates the presence of a clinically significant sleep disorder. The validity and reliability of SDSC in recent studies have been confirmed in a wide range of pediatric populations, with consistent internal reliability values of good (Cronbach's alpha > 0.70). In addition,

the Indonesian version (Spruyt & Gozal, 2023) of the *Sleep Hygiene Index* (SHI) instrument has also been tested in recent research and shows an acceptable level of reliability in measuring children's sleep habits, with Cronbach's alpha values in the moderate to good range. Data collection was carried out through filling out a structured questionnaire with the assistance of researchers to ensure respondents' understanding of each question item, thereby increasing the accuracy and reliability of the data obtained.

The collected data is processed through the stages of editing, coding, scoring, and data entry, then analyzed using univariate and bivariate analysis. Univariate analysis was used to describe the distribution of respondent characteristics and research variables, while bivariate analysis used the Chi-Square test with a significance level of 95% ($\alpha=0.05$) to determine the relationship between *sleep hygiene* and sleep disorders in elementary school-age children.

RESULTS AND DISCUSSION

Table 1 Characteristics of Respondents

Characteristics	Categories	Frequency (n)	Percentage (%)
Classes	Grade 5	24	54,5
	Grade 6	20	45,5
	Total	44	100
Age	10 years	12	27,3
	11 years old	10	22,7
	12 years	20	45,5
	13 years	2	4,5
	Total	44	100
Gender	Male	15	34,1
	Women	29	65,9
	Total	44	100
Disease History	There	7	15,9
	None	37	84,1
	Total	44	100
Sleep Independence	With parents/siblings	33	75,0
	Self-Sufficient	11	25,0
	Total	44	100

Premiere date 2025

The results showed that the majority of respondents were at the age of 12, namely 20 children (45.5%), which is the final phase of elementary school age. In this phase, children begin to experience increased academic demands, changes in social patterns, and higher intensity of gadget use. This condition has the potential to affect children's sleep habits and sleep quality. The findings of this study show that younger children tend to have irregular sleep patterns, characterized by inconsistent sleep hours, dependence on parental assistance, and a well-established bedtime routine. These irregular sleep habits contribute to poor *sleep hygiene* and increase the risk of sleep disorders in children.

These findings are in line with the theory put forward by those who state that at school age, children's sleep needs are often disrupted by emotional and psychological factors. Children begin to face certain academic, social relationships, and anxiety pressures that can trigger sleep difficulties, restless sleep, or frequent awakenings at night. If these conditions are not balanced with the application of (Jannah & Hidajat, 2024) *good sleep hygiene*, the risk of sleep disorders will increase and potentially continue into adolescence (Jannah & Hidajat, 2024).

Based on gender characteristics, this study shows that the majority of respondents are women, namely 29 children (65.9%). The results of the study also show that poor *sleep hygiene* and sleep disorders are more commonly found in the female group. One of the important findings is that there is still a high proportion of girls who experience negative emotional states before bed, such as anger, depressed, or upset. This emotional condition has the potential to interfere with the initiation process of sleep and reduce the quality of children's sleep. In addition, severe sleep disorders are also more common in the female group.

The findings are in line with research that states that adolescent girls experience sleep disorders more often than boys. It has to do with biological changes during puberty, specifically hormonal fluctuations, which

can affect sleep stability and quality. In addition to physiological factors, behavioral changes such as increased nighttime activities and the use of gadgets also contribute to increasing the risk of sleep disorders in women (Irnanda, 2023). Thus, a woman's gender can be a factor that increases susceptibility to sleep disorders due to a combination of hormonal and behavioral changes. Irnanda, (2023)

However, the findings of this study are not in line with some recent studies conducted on children in the context of hospitalization. Observational studies show that boys who undergo hospital treatment have a higher risk of sleep disorders than girls, which is characterized by increased frequency of nighttime wakefulness and decreased sleep efficiency. Similar findings were reported by those who stated that hospitalized boys tended to exhibit disturbing and hyperactive behavior in response to the discomfort of the hospital environment, thus negatively impacting sleep quality and the application of (Y. Liu et al., 2022) (Al Mamun et al., 2023) *sleep hygiene*. This difference in results confirms that sleep disorders in children are multifactorial and are greatly influenced by environmental conditions, psychological responses, and health situations experienced by children, especially in the context of hospitalization.

Respondent characteristics based on disease history showed that a small percentage of children had a history of health problems such as flu, fever, and ulcers. These health conditions have the potential to cause physical discomfort that interferes with children's sleep quality. However, because the majority of respondents had no history of the disease, the sleep disorders found in this study were more likely to be influenced by behavioral factors and sleep habits than medical factors.

These findings are in line with the opinion that sleep disorders in children are often influenced by environmental and behavioral factors, such as lighting, bedtime habits, and bed use for activities other than sleep. Children with a history of illness will be more susceptible to experiencing sleep disorders if Suri & Soleha, (2023) *the sleep hygiene* applied is irregular. Therefore, the implementation of good sleep habits is an important factor in maintaining the quality of children's sleep, both in healthy children and those who have a history of disease (Suri & Soleha, 2023)

Based on the characteristics of sleep independence, the results of the study show that most children still sleep with parents or siblings. This habit of sleeping together indicates low sleep independence in children. Children who are not independent in sleep tend to rely on the presence of parents to feel safe and find it difficult to calm down when they have trouble sleeping. This condition has the potential to inhibit the formation of healthy sleep habits and have an impact on the quality of children's sleep.

This finding is in line with Jannah's theory and which states that children's sleep independence is greatly influenced by parenting and sleep environment. A stimulating sleep environment and Jannah & Hidajat, (2024) *co-sleeping* habits can inhibit a child's ability to sleep independently. In addition, it emphasizes that children's ability to regulate activities before bed is an important part of Kurniawati & Herwanto, (2021) *sleep hygiene*. Children who are not able to control nighttime activities, such as watching television or playing gadgets, are more prone to sleep disturbances and have shorter sleep durations.

On the other hand, recent research shows that the practice of *co-sleeping* or *bed-sharing* is still widely practiced by parents because it is considered to be able to provide a sense of security, emotional comfort, and psychological closeness for children. Studies by report that Volkovich et al., (2021) *co-sleeping* is associated with increased children's sense of security and emotional regulation, especially at an early age, but at the same time can negatively impact the continuity and efficiency of parents' sleep if not accompanied by adequate sleep environment regulation. Similar findings were also expressed by those who stated that Mindell et al., (2022) *co-sleeping* can provide psychological benefits for children, but has the potential to disrupt the quality of sleep of children and parents if not balanced with a consistent sleep routine and a conducive sleep environment. Therefore, the practice of *co-sleeping* needs to be accompanied by the management of the right sleep routine and environment so that the psychological benefits obtained do not have a negative impact on the quality of sleep of children and parents.

Table 2 Frequency Distribution Based on *Sleep Hygiene* for Elementary School Age Children in Grades 5-6 at SDN 11 Telaga Biru, Gorontalo Regency

<i>Sleep Hygiene</i>	Frequency	Introduce yourself
Good	6	13.6%
Medium	22	50.0%
Bad	16	36.4%
Total	44	100%

Premiere date 2025

Based on Table 2, the majority of students in grades 5-6 at SDN 11 Telaga Biru experienced severe sleep disorders, namely 26 children (59.1%) out of a total of 44 respondents. These findings show that sleep disorders in primary school-aged children in the study area are classified as serious because most of the respondents are in

the category of severe disorders. This condition indicates poor sleep quality that has the potential to impact a child's physical, cognitive, and emotional health. In addition, Paparella et al. (2025) affirm that severe sleep disorders in children can affect daily functioning and psychological well-being of children. (Mezzofranco et al., 2025)

Based on the results of filling out the *Sleep Disturbance Scale for Children* (SDSC) questionnaire, on the indicators of sleep initiation and maintenance disorders, most children have a nighttime sleep duration of 7-8 hours, which does not meet the ideal sleep needs of elementary school-age children. In addition, the time it takes for the child to start falling asleep tends to be quite long, namely 30-45 minutes, so it shows difficulties in initiating sleep. This condition can reduce children's sleep quality and have an impact on their academic performance and psychological well-being. (Chung et al., 2023) (Mezzofranco et al., 2025)

On indicators of sleep-wake transition disorders, some children reported experiencing body jerks and delirium during sleep, which falls into the category of parasomnia. This symptom is common in school-age children and often appears in the transitional phase of sleep. Children with irregular sleep patterns and unsupportive sleep habits tend to experience parasomnia more often. (Karunanayake et al., 2025) (Ahmed et al., 2023)

Furthermore, in the indicator of impaired consciousness, it was found that there was an incidence of sleepwalking even though it was in a small proportion. Sleepwalking includes non-REM parasomnia which is more often experienced by children than adults. Factors such as fatigue, stress, and irregular sleep patterns can increase the risk of developing this parasomnia. (Cohen et al., 2024) (Pasalari et al., 2021)

In the indicators of daytime somnolence, most children reported difficulty waking up in the morning and feeling sleepy during the day. This shows that there is a disturbance in daytime function due to suboptimal quality of nightly sleep. Continuous sleep deprivation can reduce a child's concentration, attention, and learning ability at school, so attention from parents and the school is very important. (Vanagas et al., 2025) (Halal & Nunes, 2025)

Table 3 Bivariate Analysis of the Relationship between Sleep Hygiene and Sleep Disorders in Elementary School Age Children in Grades 5-6 at SDN 11 Telaga Biru, Gorontalo Regency

Sleep Hygiene	Mild Sleep Disorders	Moderate Sleep Disorders	Severe Sleep Disorders	Total
	n (%)	n (%)	n (%)	n (%)
Good	1 (16,7)	4 (66,7)	1 (16,7)	6 (100)
Medium	4 (18,2)	9 (40,9)	9 (40,9)	22 (100)
Bad	0 (0,0)	0 (0,0)	16 (100)	16 (100)
Total	5 (11,4)	13 (29,5)	26 (59,1)	44 (100)

Premiere date 2025

Based on Table 3, it can be seen that there is a difference in the level of sleep disorders based on the sleep hygiene category. Children with poor sleep hygiene all experienced severe sleep disturbances (100%), while in the moderate and good sleep hygiene category, there were still variations in the level of sleep disturbances from mild to severe. These findings suggest that the worse a child's sleep habits, the higher the severity of the sleep disorder experienced. This pattern emphasizes the importance of sleep hygiene as a factor that contributes to the quality of sleep of elementary school-age children.

The results of the Chi-Square test showed that most of the cells did not meet the requirements for the use of the test because the expected count value of <5 was found in 6 cells (66.7%). This condition causes the Chi-Square result with a p-value of 0.001 cannot be used as a basis for a strong conclusion. Therefore, the analysis was continued using Fisher's Exact Test which is more suitable for data with small frequency and uneven distribution. The results of the Fisher's Exact Test showed a p-value of 0.000, which means that there is a significant relationship between sleep hygiene and sleep disorders in elementary school-age children at SDN 11 Telaga Biru, Gorontalo Regency (Indy, 2021)

The findings of this study are in line with research conducted by those who show that severe sleep disorders dominate in elementary school children, especially in children with poor sleep hygiene. The study also confirmed that although a small percentage of children with good sleep hygiene still experience severe sleep disorders, in general, poor sleep habits increase the risk of more severe sleep disorders. This indicates that sleep hygiene is an important factor, although it is not the only cause of sleep disorders. (Ramadhani et al., 2024)

The results of this study are also supported by research that found that sleep disorders in children are related to unhealthy sleep habits, such as the use of gadgets before bed and inappropriate lighting. In addition, it shows that the implementation of good sleep hygiene can significantly improve the quality and sleep patterns of children. Alwanda & A, (2023) Daulay et al., (2024)

Overall, the results of this study strengthen the evidence that sleep hygiene has a significant association with sleep disorders in elementary school-aged children. Children with poor sleep hygiene are more prone to severe sleep disorders, which can have an impact on physical health, psychological conditions, and learning abilities. Therefore, the role of parents and schools is indispensable in forming healthy sleep habits from an early age to prevent the occurrence of long-term sleep disorders. (Faradianti, 2024)

CONCLUSION

The results of the study showed that most of the students in grades 5-6 at SDN 11 Telaga Biru, Gorontalo Regency had sleep hygiene in the medium category, which reflects that children's sleep habits have not been applied optimally. In addition, sleep disorders in respondents were dominated by severe categories, indicating that sleep problems in elementary school-age children at the research site were quite serious.

Bivariate analysis showed a significant relationship between sleep hygiene and sleep disorders in children. The use of Fisher's Exact Test yielded a p-value of 0.000 ($p < 0.05$), which indicates that children with poor sleep hygiene tend to have more severe sleep disorders. Thus, it can be concluded that sleep hygiene is an important factor related to the occurrence of sleep disorders in elementary school children in grades 5 and 6 at SDN 11 Telaga Biru, Gorontalo Regency.

SUGGESTION

Parents are expected to play an active role in forming healthy sleep habits in children through setting a regular sleep schedule, limiting the use of devices before bed, and creating a comfortable sleeping environment. Teachers and schools are expected to provide education about the importance of adequate sleep and good sleep hygiene as part of efforts to promote health in schools.

Health workers are expected to increase counseling activities and carry out early detection of sleep disorders in school-age children so that interventions can be provided appropriately. In addition, researchers are further advised to develop this study by adding other variables that have the potential to influence sleep disorders and using a larger sample count to obtain more comprehensive results.

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