



Sleep Quality and Learning Concentration in School Age Children

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ABSTRACT

Learning concentration is an individual's ability to focus attention or thoughts during the learning process, leading to behavioral change. Good concentration allows students to understand the learning material more effectively and encourages greater enthusiasm and motivation during the teaching and learning process. This study aims to analyze the association between sleep quality and learning concentration among school-age children at SDN 16 Limboto Barat, Gorontalo Regency. This study employs a quasi-experimental design with a cross-sectional approach, using purposive sampling to obtain 83 respondents. Data were collected using a questionnaire and analyzed both manually and with SPSS version 21, using univariate and bivariate analyses. The results show that the majority of respondents have good sleep quality (70 respondents, 84.3%) and good learning concentration (63 respondents, 75.9%). The results also indicate that sleep quality is associated with learning concentration among school-age children at SDN 16 Limboto Barat, Gorontalo Regency with a value of $0.000 < \alpha (0.05)$. These results are expected to serve as a foundation for efforts to improve the sleep quality of school-age children in order to support learning concentration.

1. INTRODUCTION

School-age children are generally defined as children between 6 and 12 years of age. During this period, children undergo rapid growth and development, which follows distinct patterns across different developmental domains (Zakiyah et al., 2024). One important aspect of development during this period is the ability to maintain attention and concentration. At this age, children gradually develop the ability to focus their attention on learning activities, enabling them to understand and master the material effectively. This ability is commonly referred to as learning concentration (Pendidikan et al., 2024).

Learning concentration refers to an individual's ability to focus attention and thoughts during the learning process. Concentration plays an important role in learning because it enables students to understand and master learning materials more effectively while also supporting their enthusiasm and motivation to participate actively in the teaching and learning process (Arifin, Zainul, & Etlidawati, 2020). Adequate concentration is therefore essential for effective learning. However, difficulty maintaining concentration is a common problem among students. Poor sleep quality is one of the factors that may contribute to reduced learning concentration and poorer academic achievement (Hartaji, Damar A., 2022).

Sleep quality refers to an individual's subjective satisfaction with their sleep and is reflected in their physical and mental condition during the day (Arjadi et al., 2023). Poor sleep quality may be accompanied by fatigue, exhaustion, lethargy, anxiety, apathy, dark circles under the eyes, bloodshot eyes, difficulty maintaining focus, dizziness, frequent yawning, and daytime drowsiness (Hidayat, 2021). Sleep quality is particularly important during childhood because adequate sleep supports optimal physical and cognitive development. A sleep survey conducted in the United Kingdom found that individuals who were sleep-deprived were three times more likely to experience concentration problems and twice as likely to experience fatigue, mood

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disturbances, and reduced productivity (Arifin, Zainul, & Etlidawati, 2020). The longest documented period of sleep deprivation is approximately 264 hours, or 11 days. In comparison, humans can survive for approximately 40 days without food but only about three days without water. In terms of basic physiological needs, breathing, fluid intake, sleep, and food intake are essential for human survival (Arifin et al., 2020).

According to sleep-duration recommendations from the National Sleep Foundation (NSF), insufficient sleep, defined as sleeping for less than seven hours, affects approximately 37% of children under 12 years of age worldwide (Putri, 2019). Data from the National Health and Nutrition Examination Survey involving 6,139 children under 14 years of age in the United States showed that poor sleep habits were primarily characterized by insufficient sleep duration (26%) and the absence of daytime rest or naps (26%) (Keswara et al., 2019).

Sleep disorders affect approximately 30%–35% of children. In Beijing, China, the prevalence of sleep disorders among school-aged children was reported to be 23.5%. Sleep problems in children often go unnoticed by parents and therefore may not receive appropriate attention or management. Common complaints reported by parents include irregular sleep patterns, insufficient or excessive sleep duration, nighttime awakenings, and daytime drowsiness. Studies investigating sleep quality among children have reported varying prevalence rates. In Indonesia, approximately 21.2% of children have been reported to experience sleep disturbances, while among elementary school students, the prevalence of sleep quality problems ranges from 15.3% to 39.2% (Keswara et al., 2019).

Several studies conducted in Indonesia have reported a high prevalence of sleep disorders among school-aged children and adolescents, ranging from 25% to 62.9%, depending on the characteristics of the study population and the assessment instruments used, including the Sleep Disturbance Scale for Children. In Gorontalo, 500 individuals were reported to have sleep disorders, with Gorontalo Regency recording the highest number of cases in 2023, totaling 250 individuals. Within Gorontalo Regency, Limboto District reported the highest number of cases, with 50 individuals affected.

Sleep requirements vary according to age, and inadequate sleep can adversely affect both physical and mental health. Physically, sleep deprivation may increase susceptibility to illness, including minor health problems. Psychologically and cognitively, inadequate sleep can contribute to emotional instability, impaired cognitive function, reduced concentration and attention, slower reaction times, confusion, learning difficulties, impaired creative thinking, and poorer academic performance (Sukamto, Jayanthi, & Nursamsu, 2024). Adequate sleep, on the other hand, supports memory and helps maintain sustained concentration. Insufficient sleep among children, adolescents, and adults may make it difficult to understand learning materials and may lead to excessive fatigue and daytime drowsiness, ultimately impairing concentration during study. This issue warrants serious attention because sleep deprivation can adversely affect mental health, memory, and the learning process. Sleep should therefore not be viewed merely as a passive state but as an essential restorative process that plays a fundamental role in maintaining cognitive function (Khailanisa & Linda, 2023).

2. METHOD

This study employed a quantitative research design with an analytic observational approach using a cross-sectional design. The cross-sectional design was used to examine the relationship between sleep quality and learning concentration among school-aged children, with measurements of both the independent and dependent variables conducted at a single point in time without follow-up. This design was selected to assess the association between sleep quality and learning concentration among school-aged children. The study population consisted of all students enrolled at SDN 16 Limboto Barat, with a total of 163 students. The sample was selected using purposive sampling, resulting in 83 respondents from grades 4, 5, and 6. Sample selection was based on predetermined inclusion and exclusion criteria to ensure methodological consistency and minimize potential selection bias. The inclusion criteria were active students aged 10–12 years who were cooperative and willing to participate in the study. Students who

were absent during the data collection period were excluded. Primary data were collected using questionnaires administered directly to the respondents. Before completing the questionnaires, the researcher explained the objectives and procedures of the study and obtained informed consent from the participants.

Sleep quality was assessed using the Indonesian version of the Pittsburgh Sleep Quality Index (PSQI), which has been validated and demonstrated good reliability (Cronbach's alpha = 0.83). The instrument consists of 18 items covering seven components: subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction. The global PSQI score was categorized into good, fair, and poor sleep quality based on the cut-off points established in a previous adaptation study.

Learning concentration was assessed using a questionnaire adapted from Fadhila (2022), consisting of 14 items rated on a four-point Likert scale. The instrument demonstrated satisfactory validity, with calculated *r*-values ranging from 0.548 to 0.779, and high internal consistency, with a Cronbach's alpha of 0.907. Learning concentration was categorized as good, fair, or poor based on the total score ranges established by the instrument. Ethical principles were observed throughout the study by providing participants with an explanation of the study objectives and procedures and ensuring the confidentiality of the collected data. Because the participants were school-aged children, informed consent procedures were implemented before data collection. Participants provided consent before completing the questionnaires.

The collected data were processed through several stages, including editing, coding, data entry, and data cleaning, using statistical software. The association between sleep quality and learning concentration was analyzed using the chi-square test, with a significance level of $\alpha = 0.05$. A *p*-value < 0.05 was considered statistically significant.

3. RESULT AND DISCUSSION

Result

Table 1. Distribution of Respondents Based on Sleep Quality

Sleep quality	n	%
Good	70	84,3
Enough	13	15,7
Total	83	100

Based on Table 1, most respondents had good sleep quality, accounting for 70 respondents (84.3%), while 13 respondents (15.7%) had fair sleep quality. On Table 2 the majority of respondents had good learning concentration, comprising 63 respondents (75.9%), whereas 20 respondents (24.1%) had fair learning concentration.

Table 2. Distribution of Respondents Based on Learning Concentration

Concentration in Studying	n	%
Good	63	75,9
Enough	20	24,1
Total	83	100

Table 3. Association Between Sleep Quality and Learning Concentration Among School-Aged Children

Sleep quality	Concentration in Studying				Total		P value
	Good		Enough		f	%	
	f	%	f	%			
Good	63	100	7	35	70	84,3	0,000
Enough	0	0	13	65	13	15,7	
Total	63	100	20	100	83	100	

Based on Table 3, the results showed 63 individuals (100%) with good sleep quality and good learning concentration, 0 individuals (0%) with fair sleep quality and good learning concentration, 7 individuals (35%) with good sleep quality and fair learning concentration, and

13 individuals (15.7%) with fair sleep quality and fair learning concentration. The chi-square test yielded a p-value of 0.000, which is less than the alpha value (0.05); therefore, it can be concluded that there is a relationship between sleep quality and learning concentration among school-aged children.

Discussion

The study found that among the 70 respondents with good sleep quality, 63 (90.0%) also had good learning concentration, while 7 (10.0%) had fair learning concentration. Among the 13 respondents with fair sleep quality, none had good learning concentration, whereas all 13 (100.0%) had fair learning concentration. The chi-square test showed a statistically significant association between sleep quality and learning concentration ($p < 0.001$). These findings indicate that better sleep quality was associated with better learning concentration among school-aged children at SDN 16 Limboto Barat, Gorontalo Regency.

The high proportion of respondents with good sleep quality and good learning concentration may be related to their positive responses to several learning-concentration items. In particular, many students strongly agreed with statements such as, "I am excited to start today's lesson," "I respond to the teacher's greeting with enthusiasm," and "I am enthusiastic about the lesson material to be studied." These responses suggest that adequate sleep may contribute to students' readiness, alertness, and enthusiasm during learning activities. This finding is consistent with Feriani (2020), who reported that 14 respondents (78%) had both good sleep quality and good learning concentration. The finding also supports the view that poor sleep quality may reduce alertness and subsequently impair concentration. Sleep deprivation can increase daytime drowsiness, making it more difficult for students to maintain attention and process information effectively (Feriani, 2020). Therefore, adequate sleep may play an important role in maintaining the cognitive readiness required for learning.

Nevertheless, seven respondents (10.0% of those with good sleep quality) had only fair learning concentration. This may indicate that sleep quality is not the only factor influencing students' ability to concentrate. Their responses of "sometimes" to statements such as "I am excited to start today's lesson," "I respond to the teacher's greeting with enthusiasm," and "I am enthusiastic about the material to be studied" suggest that their level of engagement and attentiveness may fluctuate despite having good sleep quality. This finding is comparable with the study by Salikunna et al. (2022), which identified students who maintained a fair level of concentration despite having poor sleep quality. Such findings suggest that learning concentration is influenced by multiple factors beyond sleep quality. These may include motivation, classroom environment, emotional state, learning interest, and individual cognitive characteristics.

The relationship between sleep and attention can also be understood from a neurocognitive perspective. Sleep plays an important role in the regulation of brain functions involved in attention, executive function, and cognitive processing. During sleep, interactions between brain regions involved in reward processing and cognitive control contribute to the regulation of attention and other cognitive processes (Salikunna et al., 2022). The dorsolateral prefrontal cortex (DLPFC), in particular, plays an important role in executive functions, including attention and cognitive control. Adequate sleep may therefore support the functioning of these neural systems and contribute to better learning concentration. In the present study, all 13 respondents with fair sleep quality also had fair learning concentration. Their responses included "never" to statements such as "I sleep soundly and feel refreshed upon waking," "I usually fall asleep after lying in bed for 15–20 minutes," and "I am able to fall asleep within 30 minutes of lying down." These responses indicate that difficulties related to sleep quality may coexist with reduced concentration during learning activities.

This finding is consistent with Arifin and Etliawati (2020), who reported that nine students (10.0%) had poor sleep quality accompanied by fair learning concentration. Feriani (2020) similarly suggested that poor sleep quality may reduce alertness and increase daytime drowsiness, thereby interfering with concentration and cognitive performance. Adequate sleep is therefore important for maintaining the alertness and cognitive capacity required for effective learning. The statistically significant association identified in this study further supports the

importance of sleep quality in children's learning processes. The researcher assumes that the high level of learning concentration observed among students with good sleep quality may be related to their positive attitudes toward learning, as reflected in their strong agreement with statements concerning enthusiasm for lessons and responsiveness to teachers. However, this interpretation should be considered cautiously because the cross-sectional design does not establish a causal relationship between sleep quality and learning concentration.

In addition to sleep quality, students' ability to manage their time may also contribute to their learning concentration. Effective time management can help students organize their daily activities and establish a balance between academic responsibilities and personal activities. Students who are able to manage their time effectively may be better prepared to participate in learning activities and maintain consistent study habits. Thus, learning concentration should be viewed as a multidimensional outcome influenced by sleep quality as well as behavioral, psychological, and environmental factors.

4. CONCLUSION

There was a statistically significant relationship between sleep quality and learning concentration among school-aged children at SDN 16 Limboto Barat, Gorontalo Regency. Most respondents had good sleep quality (84.3%) and good learning concentration (75.9%). Children with good sleep quality were more likely to have good learning concentration, indicating that sleep quality is an important factor associated with children's ability to maintain attention and concentration during learning activities.

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