

## RELATIONSHIP BETWEEN SLEEP HYGIENE AND SLEEP QUALITY IN ADOLESCENTS AGED 12-15 YEARS

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### ABSTRACT

**Background:** Good sleep is necessary for adolescents to maintain optimum health and cognitive function. Adolescents have a unique sleep behavior owing to the several hormonal changes they undergo and the variations in the circadian rhythms that regulate the sleep-wake cycle. One method for treating sleep problems in adolescents is ensuring sleep hygiene. We aimed to determine the relationship between sleep hygiene and sleep quality in adolescents aged 12–15 years at Junior High School 1 Indralaya.

**Methods:** This study used a cross-sectional design. Samples were collected from 97 adolescents using the proportionate stratified random sampling technique with questionnaires. The data were analyzed using Chi Square test.

**Results:** There was a significant relationship between sleep hygiene and sleep quality ( $p$ -value < 0.05). Sleeping is crucial for adolescents to maintain their performance in several activities, including the achievement of optimal learning outcomes. A superior sleep hygiene behavior will improve sleep quality.

**Conclusion:** Provision of health education about sleep hygiene to adolescents by health workers is important for improving the adolescents sleep quality.

**Keywords:** Adolescents, Sleep Hygiene, Sleep Quality

## HUBUNGAN ANTARA HYGIENE TIDUR DAN KUALITAS TIDUR PADA REMAJA BERUSIA 12-15 TAHUN

### ABSTRAK

**Latar belakang:** Tidur yang baik diperlukan bagi remaja untuk menjaga kesehatan dan fungsi kognitif yang optimal. Remaja memiliki perilaku tidur yang unik karena beberapa perubahan hormon yang mereka alami dan variasi dalam ritme sirkadian yang mengatur siklus tidur-bangun. Salah satu metode untuk mengobati masalah tidur pada remaja adalah memastikan kebersihan tidur. Kami bertujuan untuk menentukan hubungan antara kebersihan tidur dan kualitas tidur pada remaja berusia 12-15 tahun di SMP Negeri 1 Indralaya.

**Metode:** Penelitian ini menggunakan desain cross-sectional. Sampel dikumpulkan dari 97 remaja menggunakan teknik stratified random sampling proporsional dengan kuesioner. Data dianalisis menggunakan uji Chi Square.

**Hasil:** Ada hubungan yang signifikan antara kebersihan tidur dan kualitas tidur ( $p$ -nilai < 0,05). Tidur sangat penting bagi remaja untuk mempertahankan kinerja mereka dalam beberapa kegiatan, termasuk pencapaian hasil belajar yang optimal. Perilaku kebersihan tidur yang superior akan meningkatkan kualitas tidur.

**Kesimpulan:** Pemberian pendidikan kesehatan tentang kebersihan tidur kepada remaja oleh petugas kesehatan penting untuk meningkatkan kualitas tidur remaja.

**Kata kunci:** Remaja, Kebersihan Tidur, Kualitas Tidur

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## INTRODUCTION

Adolescence is a developmental period of transition from childhood to adulthood that passes through physical and psychological changes.<sup>1</sup> Changes occurring during this period will affect the increase in activity. The reduction in body stamina due to increased activity should be balanced by a healthy intake of nutrients, adequate rest, and sleep.<sup>2</sup> Among teenagers, sleep is very important for maintaining performances in several daily activities, including the achievement of optimal learning outcomes. Wolfson stated that adequate sleep duration improves academic achievement, physical fitness, and health. Adequate sleep can also increase attendance, and reduce illness, delay, delinquency, and violence among adolescents.<sup>3</sup>

During adolescence, one of the most common characteristics is the change in sleep timing; most teenagers sleep later and awaken late in the morning. This tendency is attributable to the influence of biological and psychosocial factors in adolescents.<sup>3</sup> In the previous 20 years, sleep researchers have found that the changes in the sleep pattern are different during adolescence than during the previous stages of age. This change is called a circadian rhythm. At the beginning of puberty, the sleep time is delayed. Teenagers are awake until later in the night and find it difficult to sleep. Sleeping at night and waking up based on the school schedules and daily life activities causes reduction in the sleep duration in adolescents.<sup>4</sup>

The National Sleep Foundation states that 2 out of 3 teenagers worldwide do not get enough sleep.<sup>5</sup> Another study revealed that 31.9% of 68,418 adolescents have a lower than optimal sleep duration, ranging from 6–7 hours daily.<sup>6</sup> Few epidemiological studies have been conducted on the prevalence of sleep disorders in adolescents in Indonesia. One study revealed that the prevalence of sleep disturbance among

adolescents aged 12–15 years in East Jakarta was 62.9%.<sup>7</sup> Another study reported a prevalence of 81.1% in adolescents (12–15 years) in Semarang.<sup>8</sup> Another trial showed that children with inadequate sleep scored poorly on intelligence quotient (IQ) tests, got lower grades in the classroom setting, and were more absent and late.<sup>9</sup>

Teenagers with sleep disorders are susceptible to social pressure. Therefore, education, counseling, and psychological support are more suitable for managing sleep issues than treatment with medication in this age group.<sup>4</sup> Standards in sleep management practices in adolescents that important to improve sleep quality.<sup>10</sup> Sleep hygiene is a primary nursing care in the treatment of sleep problems. Sleep hygiene in adolescents is defined as a behavioral practice that can improve sleep quality, ensure adequate sleep duration, and enable complete alertness during the day.<sup>11</sup>

Several studies have shown that proper sleep hygiene behaviors have a considerable influence on sleep quality, proving that it can serve as a recommended non-pharmacological approach for improving sleeping habits.<sup>12</sup> Although several studies have investigated the importance of sleep hygiene behavior for good sleep quality, few have discussed this relationship in adolescents. Further, these trials are limited to the elderly group. The aim of this study was to determine the relationship between sleep hygiene and sleep quality in adolescents.

## METHODE

### Study Design and Sampling Procedure

This quantitative research used a cross-sectional study design. The study population comprised 702 adolescents aged 12–15 years. The sampling technique used the probability

sampling method with the proportionate stratified random sampling approach that balances the number of study subjects based on each class, followed by random sampling based on the inclusion criteria. Total 97 subjects met the inclusion criteria.

Sleep hygiene behavior was the independent variable and sleep quality was the dependent variable. The study used the Pittsburgh Sleep Quality Index<sup>13</sup> and a modified Adolescent Sleep Hygiene Scale<sup>11</sup>. The researchers modified the Adolescent Sleep Hygiene Scale (ASHS) questionnaire by taking 6 of the 9 aspects in the questionnaire. The measuring scale on the ASHS questionnaire was divided into two categories; a total score  $\leq 30$  indicated good sleep hygiene, and a total score  $> 30$  indicated poor sleep hygiene. This ASHS questionnaire has been tested for validity on 15 samples.

## RESULTS

About half the respondents in this study were boys (51.5%). Univariate analyses showed that more than half of the respondents had poor sleep hygiene behavior (53.6%), and most had good sleep quality (58.8%). Bivariate analyses was conducted using chi square test and showed a significant correlation between sleep hygiene behavior and sleep quality in adolescents aged 12–15 years in Junior High School 1 Indralaya ( $p$ -value 0.01).

## Ethical Considerations

Prior to conducting the research, the researcher obtained informed consent from all the study subjects after providing them an explanation regarding the research objectives, benefits for the respondents, and confidentiality guarantee for the identity and information given by the respondents.

## Data Processing and Analyses

This research was conducted during July 2016 in Junior High School 1 Indralaya. The research data were processed and analyzed statistically. Univariate statistical analyses were conducted using proportions. Bivariate analyses were conducted using chi-square test to determine the relationship between sleep hygiene and sleep quality of adolescents aged 12–15 years in Junior High School 1 Indralaya.

**Table 1**  
The sex-distribution as well as sleep hygiene and sleep quality characteristics of the respondents in Junior High School 1 Indralaya

Variables	Frequency (n)	Percentage (%)
<b>Gender</b>		
Male	50	51.5
Female	47	48.5
Total	97	100
<b>Sleep Hygiene</b>		
Good	45	46.4
Poor	52	53.6
Total	97	100
<b>Sleep Quality</b>		
Good	57	58.8
Poor	40	41.2
Total	97	100

**Table 2**  
**Relationship between sleep hygiene and sleep quality in adolescents aged 12–15 years in Junior High School 1 Indralaya**

<i>Sleep Hygiene</i>	<i>Sleep Quality</i>				<i>Total</i>	<i>p-value</i>
	<i>Good</i>		<i>Poor</i>			
	<i>n</i>	<i>(%)</i>	<i>n</i>	<i>(%)</i>	<i>n</i>	<i>(%)</i>
Good	41	91.1	4	8.9	45	100
Poor	16	30.8	36	69.2	52	100
Total	57	58.8	40	41.2	97	100

## DISCUSSION

Sleep hygiene analyses showed that more than half of the respondents had poor sleep hygiene behavior (53.6%). The 6 basic components of sleep hygiene considered in this study were physiological aspects, cognitive-emotion, sleep stability, nap, sleep environment, and behavior. The first aspect is physiological and relates to the food and drink that a person consumes close to the sleeping time at night; it also relates to one's physical condition at night before sleeping<sup>14</sup>. In this study, the physiology aspect was studied by asking the subjects about their caffeine consumption habit before bedtime. Most respondents (93.3%) reported never consuming coffee or smoking cigarettes 4 hours before bedtime. According to a research by Lohsoonthorn, caffeine consumption interferes with sleep quality in Thai students<sup>15</sup>. Caffeine inhibits the effect of A1 and A2a adenosine on the central nervous system that keeps the body alert<sup>16</sup>.

The second aspect is the cognitive-emotion aspect. This aspect assesses the negative emotional state of a person that can affect a person's behavior before sleeping<sup>14</sup>. Most respondents with poor sleep hygiene behaviors state that they often feel anxious when they are about to fall asleep. Teenagers are more vulnerable to psychological distress because their transition from adolescence to adulthood<sup>17</sup>. Adolescence is a period called heightened emotionality where the emotional state seems

more heightened than that in normal circumstances. This makes teenagers feel angry easily, anxious when facing problems, and interferes with their sleep process. In theory, anxiety can increase the norepinephrine levels in the blood by stimulating the sympathetic nervous system that can interfere with the sleep patterns<sup>18</sup>.

The next aspect is that of sleep stability. This aspect determines the habits of an individual's everyday sleeping schedule<sup>14</sup>. The results of this study show that most respondents with poor sleep hygiene behaviors had different sleep durations each night. Based on the research by Khazaie, the most common problem of sleep hygiene behavior was an irregular sleep schedule (78%)<sup>19</sup>. Previous studies have shown that individuals who sleep and wake up at the same time each day, including weekends and holidays, have good sleep and do not experience sleep disturbance<sup>20</sup>.

Another aspect of sleep hygiene behavioral assessment is the habit of napping. We found that most respondents with bad sleep hygiene had a habit of taking a nap for more than an hour, once or twice a week. This is in line with the report by Bindu, according to which, most adolescents (52.1%) had a habit of napping during school days<sup>21</sup>. Individuals with poor sleep hygiene, such as has a habit of napping that will make it difficult for somebody to start sleeping at night because sleep too much during the day<sup>22</sup>.

The sleep environment factor is also a part of the behavioral component of sleep hygiene. This factor is related to all the conditions around the bed, such as the room's temperature and the sounds that can affect the sleep process. Based on the present results, most respondents with poor sleep hygiene behaviors stated that they often fell asleep while watching television. This is supported by research that states that falling asleep while watching the television signifies poor sleep hygiene<sup>14</sup>. The results also showed that most respondents with poor sleep hygiene often felt hot in the bedroom. Most people get adequate sleep at temperatures around 65°F or 18°C and adequate ventilation. Bedrooms that are too hot or too cold interfere with sleep<sup>14</sup>.

The last aspect is behavior. This aspect assesses the behaviors that keep a person awake for longer hours of night, such as using a cell phone, watching television, and playing video games<sup>14</sup>. The results showed that most respondents with poor sleep hygiene behaviors performed various activities that kept them active at night hours, such as watching television and playing games on their mobile phones. These practices result in a physiological state of the body that occurs when a person uses an electronic device; the cerebral cortex secretes norepinephrine and the middle brain secretes a dopamine neurotransmitter. Both neurotransmitters are part of the Reticular Activating System (RAS) that functions to maintain the wakefulness state<sup>23</sup>.

Results of the research related to sleep quality showed that more than half of the respondents in this study had good sleep quality (58.8%). This is in line with Xu's study in which nearly half of the respondents (49%) aged 10–15 years had good sleep quality<sup>24</sup>. Almost half the respondents in this study were boys (51.5%) who tended to have better sleep quality than girls. This is supported by Agustya who revealed that girls tended to be influenced by feelings that

disturbed them psychologically, thus impairing the sleep quality<sup>22</sup>.

Further analyses using chi square test showed a significant correlation between sleep hygiene behavior and sleep quality (p-value = 0.01, value  $\alpha = 0.05$ ). In the results of this study known 91.1% of respondents have good sleep hygiene behavior and so have a good sleep quality. These results are supported by Dolan who stated that sleep hygiene behavior is directly proportional to the increase in sleep quality<sup>25</sup>. Based on the present results, respondents with good sleep hygiene behavior in both categories had an average 15 min longer night sleep duration than those with poor sleep hygiene behavior. This result is consistent with previous reports that state that adolescents with good sleep hygiene had a longer sleep duration (30-minute longer)<sup>14</sup>. Some previous studies suggest that adequate sleep duration may be advantageous for adolescent development. According to Owens, Belon, and Moss, adding 45-minute of night sleep on school days can increase the emotional stability and improve awareness during the day<sup>26</sup>.

The present study also indicated that 30.8% of the respondents had poor sleep hygiene behavior but had good sleep quality. Based on these results, most respondents had a habit of often thinking of something that had happened at school and watching the clock several times before falling asleep. Most respondents did not have sleep disorders, such as not being able to fall asleep within 30 minutes, waking up in the middle of the night, inability to breathe comfortably, feeling of pain, and having nightmares. The average number of sleep hours for the respondents was 8.5 hours/day. This is consistent with the National Sleep Foundation's recommendation of 8.5 hours/day of sleep for normal adolescents<sup>5</sup>. Researchers assume that this is related to the effective coping mechanism of an individual who is able to control his/her emotions and thoughts to prevent them from

interfering with sleep needs. Effective coping is a self-defense mechanism that helps a person deal with and accept stressful situations without pressure. If the coping is stronger than the existing stressors, it will prevent excessive mental burden that can interfere with the quality of sleep<sup>27</sup>.

A limitation of this study was that the researchers did not consider other factors related to sleep hygiene behavior, such as socioeconomic status, personality, and others, that can affect sleep quality. These factors were not studied in this study so that they can be considered for further research.

## CONCLUSION

More than half the respondents had poor sleep hygiene behavior (53.6%) and good sleep quality (58.8%). There was a significant relationship between sleep hygiene behavior and sleep quality in adolescents aged 12–15 years in Junior High School 1 Indralaya ( $p$ -value  $0.01 \leq 0.05$ ). Health workers, especially community nurses, are expected to facilitate adolescents by providing them with health education on good sleep hygiene practices and its impact on sleep quality.

## REFERENCES

- Rahman MM, Ahmad SA, Karim MJ, et al. Factors Influencing Smoking Initiation Among The Secondary School Students In Bangladesh: Findings From A Cross Sectional Study. *Malaysian Journal of Public Health Medicine* 2014; **14**(1):66-78 [http://www.mjphm.org.my/mjphm/index.php?view=article&catid=92%3A2014-volume-14-1&id=578%3Afactors-influencing-smoking-initiation-among-the-secondary-school-students-in-bangladesh-findings-from-a-cross-sectional-study&format=pdf&option=com\\_content&Itemid=112](http://www.mjphm.org.my/mjphm/index.php?view=article&catid=92%3A2014-volume-14-1&id=578%3Afactors-influencing-smoking-initiation-among-the-secondary-school-students-in-bangladesh-findings-from-a-cross-sectional-study&format=pdf&option=com_content&Itemid=112) (accessed 15 November 2018).
- Colrain IM, Baker FC. Changes in Sleep as a Function of Adolescent Development. *Neuropsychol Rev* 2011; **21**:5–21 <https://www.pdf-archive.com/timer.php?id=33399> (accessed 16 February 2016).
- Wolfson AR, Downs HEM. *The Oxford Handbook of Infant, Child, and Adolescent Sleep and Behavior*. Oxford, England: Oxford University Press; 2013: 3-5 <http://google.books.com> (accessed 23 February 2016).
- Carney PR, Berry RB, Geyer JD. *Clinical Sleep Disorders* (2<sup>nd</sup> ed.). Philadelphia, US: Lippincott Williams dan Wilkins; 2011:135-141 <http://google.books.com> (accessed 16 February 2016).
- National Sleep Foundation. *Teens and sleep: summary of findings*. 2006. <https://sleepfoundation.org/sleep-polls-data/sleep-in-america-poll/2006-teens-and-sleep> (accessed 10 February 2016).
- Smaldone A, Honig JC, Byrne MW. Sleepless in America: inadequate sleep and relationships to health and well-being of our nation's children. *Pediatrics* 2007; **119**:29–37 [http://pediatrics.aappublications.org/content/119/Supplement\\_1/S29](http://pediatrics.aappublications.org/content/119/Supplement_1/S29) (accessed 10 February 2016).
- Haryono A, Almitra R, Alia A, et al. Prevalensi Gangguan Tidur pada Remaja Usia 12-15 Tahun di Sekolah Lanjutan Tingkat Pertama. *Sari Pediatri* 2009; **11**(3):149–154 <https://saripediatri.org/index.php/saripediatri/article/view/585> (accessed 10 February 2016).
- Awwal H. Prevalensi Gangguan Tidur Pada Remaja Usia 12-15 Tahun: Studi pada Siswa SMP N 5 Semarang. *Media Medika Muda* 2015; **4**(4):873–880 <https://ejournal3.undip.ac.id/index.php/medi>

- co/article/view/9780/9501 (accessed 10 February 2016).
9. Buckhalt JA, El-Sheikh M, Wolfson A. Sleep and Sleep Disorders in Children and Adolescents. *Communique* 2015; **44**(2):26–27  
[http://www.psych.theclinics.com/article/S0193-953X\(06\)00075-X/pdf](http://www.psych.theclinics.com/article/S0193-953X(06)00075-X/pdf) (accessed 16 February 2016).
  10. Forquer LM, Camden AE, Gabriau KM. Sleep Patterns of College Students at a Public University. *Journal of American College Health* 2008; **56**(5):563–565  
<https://www.ncbi.nlm.nih.gov/pubmed/18400669> (accessed 16 February 2016).
  11. LeBourgeois MK, Flavia G, Flavia C. The Relationship Between Reported Sleep Quality and Sleep Hygiene in Italian and American Adolescents. *Pediatrics* 2005; **115**(10):257–265  
<https://www.ncbi.nlm.nih.gov/pubmed/163928632/> (accessed 16 February 2016).
  12. Malone SK. Early to Bed, Early to Rise?: An Exploration of Adolescent Sleep Hygiene Practices. *Journal of School Nursing* 2011; **27**(5):348–354  
<http://journals.sagepub.com/doi/abs/10.1177/1059840511410434?journalCode=jsnb> (accessed 16 February 2016).
  13. Buysse DJ, Reynolds CF, Monk TH. Pittsburgh Sleep Quality Index: A New Instrument for Psychiatric Practice and Research. *Psychiatry Research* 1989; **28**:193–213  
<https://www.ncbi.nlm.nih.gov/pubmed/2748771> (accessed 10 February 2016).
  14. Storfer-Isser A, Monique KL, John H. Psychometric properties of the Adolescent Sleep Hygiene Scale. *Journal of Sleep Research* 2013; **22**:707–716  
<http://onlinelibrary.wiley.com/doi/10.1111/jsr.12059/full> (accessed 10 February 2016).
  15. Lohsoonthorn V, Hazar K, Gardenia C, et al. Sleep quality and sleep patterns in relation to consumption of energy drinks, caffeinated beverages, and other stimulants among Thai college students. *Sleep Breath* 2013; **17**(3):1017-1028  
<https://www.ncbi.nlm.nih.gov/pubmed/23621002/> (accessed 10 February 2016).
  16. Roehrs T, Roth T. Caffeine: Sleep and daytime sleepiness. *Sleep Medicine Reviews* 2008; **12**(2):153–162  
[http://www.smrv-journal.com/article/S1087-0792\(07\)00093-7/fulltext](http://www.smrv-journal.com/article/S1087-0792(07)00093-7/fulltext) (accessed 16 February).
  17. Talwar P, Tan KW, Kartini AG, et al. The Goodness-Of-Fit Of Dass-21 Models Among University Students. *Malaysian Journal of Public Health Medicine* 2016; **16**(3):219-226  
[http://www.mjphm.org.my/mjphm/journals/2016%20-%20Volume%2016%20\(3\)/THE%20GOODNESS-OF-FIT%20OF%20DASS-21MODELS%20AMONG%20UNIVERSITY%20STUDENTS.pdf](http://www.mjphm.org.my/mjphm/journals/2016%20-%20Volume%2016%20(3)/THE%20GOODNESS-OF-FIT%20OF%20DASS-21MODELS%20AMONG%20UNIVERSITY%20STUDENTS.pdf) (accessed 15 November 2018).
  18. National Research Council and Institute of Medicine. Sleep Needs, Patterns, and Difficulties of Adolescents. Forum on Adolescence. In : Mary GG, ed. *Board on Children, Youth, and Families, Commission on Behavioral and Social Sciences and Education*. Washington, DC: National Academy Press; 2000:3-14  
<http://www.nap.edu> (accessed 20 February 2016).
  19. Khazaie H, Azita C, Kheirollah S, et al. Sleep Hygiene Pattern and Behaviors and Related Factors among General Population in West Of Iran. *Global Journal of Health Science* 2016; **8**(8):114–120  
[https://www.researchgate.net/publication/287506947\\_Sleep\\_Hygiene\\_Pattern\\_and\\_Behaviors\\_and\\_Related\\_Factors\\_among\\_General\\_Population\\_in\\_West\\_Of\\_Iran](https://www.researchgate.net/publication/287506947_Sleep_Hygiene_Pattern_and_Behaviors_and_Related_Factors_among_General_Population_in_West_Of_Iran) (accessed 10 February 2016).

20. Noland H, Price JH, Dake J. Adolescent's Sleep Behaviors and Perceptions of Sleep. *Journal of School Health* 2009; **79**(5):224–230  
<https://www.ncbi.nlm.nih.gov/pubmed/19341441> (accessed 16 February 2016).
21. Bindu J. Sleep patterns, sleep hygiene behaviors and parental monitoring among Bahrain based Indian adolescents. *Journal of Family Medicine and Primary Care* 2015; **4**:232–237  
<http://www.jfmpc.com/article.asp?issn=2249-4863;year=2015;volume=4;issue=2;spage=232;epage=237;aulast=John> (accessed 20 February 2016).
22. Agustya N. Sleep Hygiene and Sleep Quality in College Student. *Thesis*. Depok: Indonesian University 2015: 22  
[http://lib.ui.ac.id/detail?id=20411615&lokal\\_i=lokal](http://lib.ui.ac.id/detail?id=20411615&lokal_i=lokal) (accessed 20 February 2016).
23. Wong LD, Marilyn HE, David W, et al. *Buku Ajar Keperawatan Pediatrik*. Jakarta, Indonesia: EGC; 2002.
24. Xu Z, Su H, Zou Y, et al. Sleep Quality of Chinese adolescents: Distribution and its associated Factors. *Journal of Paediatrics and Child Health* 2012; **48**:138–145  
<https://www.ncbi.nlm.nih.gov/pubmed/21470332> (accessed 20 February 2016).
25. Dolan CL. *Developmental Perspectives on Community Beliefs and Attitudes about Sleep*. Melbourne: Victoria University; 2013:94-96  
<http://vuir.vu.edu.au/22301/1/Chelsea%20Louise%20Dolan.pdf> (accessed 20 February 2016).
26. Owens JA, Belon K, Moss P. Impact of delaying school start time on adolescent sleep, mood, and behavior. *Arch Pediatr Adolesc Med* 2010; **164**(7):608–614  
<https://pdfs.semanticscholar.org/204f/6c62eed2b10a060bac4e444358d8be04d304.pdf> (accessed 20 February 2016).
27. Mardiana D, Atun RM, Arni NR. Relationship Between Coping Mechanism with Quality of Life in Patients with Cervix Cancer. *Journal of Maternity Nursing* 2013; **1**(1):9-20  
<http://jurnal.unimus.ac.id/index.php/JKMat/article/download/928/980> (accessed 20 February 2016).