



RELATIONSHIP BETWEEN CHRONOTYPE AND SLEEP QUALITY AMONG ADOLESCENTS AT JAMBI HIGH SCHOOL

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<p>Info Article</p> <p>Received : 02 Januari 2026</p> <p>Revised : 05 Februari 2026</p> <p>Accepted : 03 Maret 2026</p> <p>Publication : 31 Maret 2026</p>	<p>Abstract: <i>Sleep is a fundamental physiological need that supports adolescents' cognitive, emotional, and physical development. However, poor sleep quality remains common among adolescents and may be influenced by biological factors such as chronotype. This study aimed to analyze the relationship between chronotype and sleep quality among adolescents at SMA Negeri 8 Jambi City. A quantitative cross-sectional design was used with 103 students selected through stratified random sampling. Chronotype was measured using the Morningness–Eveningness Questionnaire (MEQ), while sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI). Data were analyzed using univariate and Chi-square tests. The results showed that most respondents had an intermediate chronotype (54.4%) and poor sleep quality (61.2%). Statistical analysis indicated a significant relationship between chronotype and sleep quality ($p = 0.020$; Cramer's $V = 0.276$). Adolescents with evening chronotype tended to experience poorer sleep quality compared with those with morning chronotype.</i></p>
<p>Keywords: <i>Chronotype, Sleep Quality, Adolescents, Circadian Rhythm, Students.</i></p> <p>Kata Kunci: Kronotipe, Kualitas Tidur, Remaja, Ritme Sirkadian, Siswa</p>	<p>Abstrak: <i>Tidur adalah kebutuhan fisiologis mendasar yang mendukung perkembangan kognitif, emosional, dan fisik remaja. Namun, kualitas tidur yang buruk masih umum terjadi di kalangan remaja dan dapat dipengaruhi oleh faktor biologis seperti kronotipe. Penelitian ini bertujuan untuk menganalisis hubungan antara kronotipe dan kualitas tidur di kalangan remaja di SMA Negeri 8 Kota Jambi. Desain kuantitatif cross-sectional digunakan dengan 103 siswa yang dipilih melalui stratified random sampling. Kronotipe diukur menggunakan Morningness–Eveningness Questionnaire (MEQ), sedangkan kualitas tidur dinilai menggunakan Pittsburgh Sleep Quality Index (PSQI). Data dianalisis menggunakan uji univariat dan Chi-square. Hasil menunjukkan bahwa sebagian besar responden memiliki kronotipe intermediate (54,4%) dan kualitas tidur yang buruk (61,2%). Analisis statistik menunjukkan hubungan yang signifikan antara kronotipe dan kualitas tidur ($p = 0,020$; Cramer's $V = 0,276$). Remaja dengan kronotipe malam cenderung mengalami kualitas tidur yang lebih buruk dibandingkan dengan mereka yang memiliki kronotipe pagi.</i></p>
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INTRODUCTION

Basic human needs are diverse and must be met. One of these is rest and sleep. Sleep is a basic physiological need that plays a crucial role in maintaining well-being and survival. Through sleep, the body undergoes a natural process of recovery and repair (Iilhi et al., 2024). During adolescence, adequate and quality sleep plays an important role because this phase is marked by the need for sleep to support cognitive function, emotional stability, and physical health (Chong, 2024). The American Academy of Sleep Medicine recommends that adolescents aged 13–18 years get 8–10 hours of sleep per night to maintain optimal body function and support ongoing growth and development (Paruthi et al., 2016). In line with this, the American Academy of Pediatrics also emphasizes the importance of adequate and quality sleep duration to prevent the negative effects of sleep deprivation, including impaired concentration, decreased academic performance, increased risk of accidents, and mental health problems such as depression and anxiety (Au et al., 2014).

Sleep quality is an individual's ability to maintain sleep, resulting in freshness and well-being upon awakening. Good sleep quality is characterized by ease of falling asleep (sleep latency ≤ 30 minutes), sustained sleep without frequent awakenings, adequate sleep duration, and a feeling of refreshment upon waking. The World Health Organization (WHO) through the Health Behavior in School-aged Children (HBSC) study reported that 20-30% of adolescents aged 11-15 years in 44 countries experience disturbed sleep patterns, with an average of < 8 hours of sleep per night, which increases the risk of mental stress and academic impairment (Chahine et al., 2018).

Similarly, in the United States, data from the Centers for Disease Control and Prevention (CDC) shows that 72.7% of high school students sleep less than 8 hours per night and have difficulty waking up in the morning due to poor sleep quality during the school day, which contributes to poor sleep quality (Uccella et al., 2023). The 2019 Basic Health Research (Riskesmas) data from the Indonesian Ministry of Health shows that 33.8% of adolescents aged 10-18 years experience poor sleep quality (RI, 2018). In Indonesia, the prevalence of poor sleep quality in adolescents to early adulthood is very high at 62.9%, but even though it has been widely found, not much has been done to address this problem in Indonesia (Makrina et al., 2022). In line with this, research conducted by Yohana Tiur Siregar on high school students in Jambi City found that out of a total of 552 students, 64.1% had poor sleep quality (Siregar, 2023).

Poor sleep quality can manifest through various signs and symptoms, including: difficulty initiating sleep, frequent nighttime awakenings, waking up too early and being unable to fall back asleep, feeling unrefreshed or tired despite sleeping, excessive daytime sleepiness, difficulty concentrating, irritability or mood swings, and decreased performance in daily activities. This condition can negatively impact adolescents in various aspects of life. Poor sleep quality has been shown to decrease concentration, memory, and problem-solving skills, which can lead to decreased academic performance (Anggraini et al., 2025). In terms of physical health, poor sleep quality increases the risk of death and degenerative diseases such as: hypertension, cardiovascular disease and diabetes mellitus (Catri Wulansih et al., 2024). Poor sleep quality also has the potential to increase the risk of experiencing depression, anxiety and psychological disorders in adolescents (Mcnamara et al., 2023).

Factors that influence sleep quality include biological, psychological, behavioral, and environmental factors. Biologically, puberty is characterized by a shift in the circadian rhythm that causes a delayed sleep phase. This change is mediated by a shift in melatonin secretion, which occurs later at night, causing adolescents to feel more awake at night and have difficulty waking up in the morning. This phenomenon, known as delayed sleep phase syndrome, is a normal part of adolescent development, but can negatively impact sleep quality when it clashes with social schedules, such as early school hours (Stephanie J. Crowley, Amy R. Wolfson, Leila Tarokh, 2018).

Another internal biological factor that influences sleep quality is chronotype. Chronotype, or chronobiological type, is an individual's natural preference for sleeping and waking times, as well as the optimal times for daily activities, which are controlled by circadian rhythms (Natarajan et al., 2025). Based on this time preference, chronotypes are classified into three types: morning type, evening type, and intermediate type. Chronotype is influenced by genetics, age, hormones, and environmental factors such as light exposure, and changes throughout life (Liu et al., 2025).

The phenomenon of chronotype is explained in the Circadian Rhythm Theory and the Two Process Model of sleep developed by Borbely (Borbély, 2022). This theory explains that sleep-wake patterns are regulated through the interaction of two main physiological processes: sleep homeostasis (Process S), which increases sleep pressure, and circadian rhythms (Process C), which regulate optimal sleep and wakefulness times. Individual differences in the timing of these circadian processes shape chronotype variation within the population. When circadian rhythms are out of sync with the demands

of social schedules, a phenomenon called social jet lag can occur. Social jet lag refers to a misalignment between an individual's biological clock and their social clock, as measured by the difference in mid-sleep time between weekdays and holidays. This condition can reduce sleep duration and quality because the sleep cycle cannot occur optimally at the correct circadian rhythm (Luo et al., 2025).

During adolescence, biological changes occur that cause a shift in chronotype, so that teenagers tend to sleep later and wake up later (Roenneberg et al., 2003). When teenagers with an evening chronotype have to follow a school schedule that starts early in the morning, they will experience pressure to sleep and wake up at times that do not align with their biological clock, resulting in the accumulation of sleep debt, especially on school days, which is then compensated by sleeping longer on weekends. Furthermore, teenagers with an evening chronotype are more susceptible to academic stress, depression, and other mental health disorders (Aktas & Pinar Guzel Ozdemir, 2023). Putri's research in Indonesia showed a similar phenomenon, that students with an evening chronotype tend to have higher levels of social jet lag and academic stress than other types (Putri, 2020).

Several studies have shown a relationship between chronotype and sleep quality in adolescents, but the strength and pattern of this relationship vary across populations. A study by Lang et al. of Australian adolescents showed that individuals with a late chronotype were at greater risk for poor sleep quality and mood disorders (Lang et al., 2022). Rohman et al.'s scoping review found that evening chronotype is associated with a variety of physical and psychological problems, including circadian rhythm disturbances resulting in restless sleep (Rohman et al., 2024). However, the strength of this relationship varies and is not uniform across populations.

Raman & Coogan found a small association between evening chronotype and poor sleep quality in young adults with $\rho = 0.212$ ($p < 0.001$) (Raman & Coogan, 2019). This indicates individual variability in response to chronotype mismatch with social schedules. Research conducted by Fathurahman et al. in Makassar showed chronotype variation among adolescents, with intermediate chronotypes having a greater proportion (44%) than evening types (28%) (Fathurahman et al., 2025), shows that the proportion of adolescents with different chronotypes in Indonesia can vary depending on population characteristics and local context.

Variations in the strength of the relationship across populations indicate the presence of underexplored contextual factors. In Indonesia, particularly in Jambi City,

empirical data on the relationship between chronotype and sleep quality in high school students is still very limited. Research conducted by Yohana Tiur Siiregar in Jambi City only identified the prevalence of poor sleep quality in high school students (64.1%), but did not examine chronotype as a determinant (Siiregar, 2023). It is also unknown whether the chronotype distribution patterns of Indonesian adolescents produce different relationships than those of other populations. Characteristics of Indonesian adolescents differ from those of Western countries, such as exposure to natural light, napping habits, and school schedule structure, may influence the relationship between chronotype and sleep quality.

This study selected high school students as subjects because adolescence is a period during which chronotype shifts occur due to the biological changes of puberty. In the context of education in Indonesia, particularly at the senior high school (SMA) level in Jambi City, uniform school schedules, which tend to start early in the morning, often conflict with students' biological sleep preferences, particularly those with an evening chronotype. This situation has the potential to cause a misalignment between biological rhythms and social schedules, which can ultimately impact sleep quality, health, concentration, memory, and academic performance.

According to data from the Jambi Provincial Education Office in 2024, SMA Negeri 8 Jambi City has the largest enrollment in Jambi City, with 1,282 students. Researchers conducted a preliminary study in July through structured interviews and direct observations with students and teachers. Interviews with 15 students revealed that the majority (11 out of 15) had a habit of sleeping late, with bedtimes ranging from 11:00 PM to 1:00 AM WIB. Meanwhile, wake-up times on school days were relatively consistent, between 5:00 and 5:30 a.m. WIB (Western Indonesian Time).

Therefore, students' average sleep duration on school days was only around 4-6 hours per night, which is below the recommended 8-10 hours per night for adolescents. Students reported that the main causes of late nights were cell phone use for social media and entertainment, as well as completing school assignments late at night. Furthermore, almost all students reported differences in sleep patterns between school days and holidays, with holidays tending to go to bed later and wake up later, resulting in longer sleep durations than on school days.

The impact of these sleep patterns was directly felt by students on their learning activities. Nine out of 15 students reported difficulty concentrating during morning lessons, characterized by drowsiness, difficulty focusing on teacher explanations, and a

decreased ability to understand the material. This inability to concentrate was due to insufficient sleep at night, which led to decreased alertness and cognitive function in the morning. The researchers' observations during morning classes also revealed some students who appeared sleepy, yawned frequently, lowered their heads, and were less active in the learning process. These findings were reinforced by interviews with five subject teachers, who stated that some students appeared less focused and tired easily in the early hours of class, especially in subjects requiring high concentration.

For comparison, the researchers also conducted a preliminary study at SMA Negeri 5, Jambi City, interviewing 10 students. The results indicated that the students' sleep patterns were relatively better, although complaints of drowsiness and difficulty concentrating during morning classes were still found. Problems with sleep quality and their impact on learning concentration were more pronounced at SMA Negeri 8, which also has a larger student population (1,282), making it more representative of the study population. This phenomenon indicates a misalignment between students' sleep patterns and the morning class schedule, potentially related to differences in chronotype.

Considering the limited research on the relationship between chronotype and sleep quality in high school adolescents in Jambi City, as well as the importance of understanding the pattern of this relationship in the context of the characteristics of Indonesian adolescents for the development of chronobiology-based interventions, the researchers were interested in conducting this study at SMA Negeri 8 Jambi City as a comparison, the researchers also conducted a preliminary study at SMA Negeri 5 Jambi City by interviewing 10 students. The results showed a similar pattern, but sleep quality problems and their impact on learning concentration appeared to be more prominent in SMA Negeri 8 Jambi City. This, coupled with the larger number of students at SMA Negeri 8 (1,282 students) so that it is more representative as a research population, strengthened the researchers' decision to determine SMA Negeri 8 Jambi City as the main research location.

METHOD

This study used a quantitative method with a cross-sectional design, where variable measurements were conducted once at the same time. The study was conducted at SMA Negeri 8 Jambi City on February 5, 2026, with a population of 1,342 students. The sample was determined using the Slovin formula of 103 students consisting of 28 students in grade X, 29 students in grade XI, and 46 students in grade XII. The sampling technique

used was stratified random sampling with respondents selected through simple random sampling. Data collection used the Morningness-Eveningness Questionnaire (MEQ) questionnaire to measure chronotype and the Pittsburgh Sleep Quality Index (PSQI) to measure sleep quality. The research data consists of primary data obtained through questionnaires from students in grades X, XI, and XII of SMAN 8 Jambi City as well as secondary data from school documentation.

Data collection was conducted through several stages, namely research preparation and permitting, determining respondents using simple random sampling, providing explanations and obtaining informed consent, completing the MEQ and PSQI questionnaires, checking the completeness of the data, and closing the research activity. Before being processed, the data were tested for validity and reliability using r count and Crombach's alpha. Data processing included editing, coding, processing, cleaning, and tabulating. Data analysis used univariate analysis to describe the frequency and percentage distributions and bivariate analysis with the Chi-Square test to determine the relationship between chronotype and sleep quality. This study has also obtained ethical approval from the Ethics Committee of the Faculty of Medicine and Health Sciences, University of Jambi.

RESULTS AND DISCUSSION

Results

Respondent Characteristics

Table 1. Frequency Distribution of Respondent Characteristics

Variable	Category	n = 103	Percentage (%)
Age	15	27	26.2
	16	28	27.2
	17	42	40.8
	18	6	5.8
Gender	Female	62	60.2
	Male	41	39.8

Based on Table 1, most respondents were 17 years old, totaling 42 students (40.8%), while the smallest proportion was 18 years old, with 6 students (5.8%), indicating that the majority of participants were in the middle adolescence stage, which is characterized by distinctive physical, biological, and sleep pattern changes. In terms of gender, the majority of respondents were female, with 62 students (60.2%), while 41 students (39.8%) were male, showing that the participants were dominated by female

students but still represented the general gender composition of students at SMA Negeri 8 Jambi City.

Univariate Analysis

Table 2. Distribution of Chronotype Frequency and Sleep Quality of Adolescents at State Senior High School 8, Jambi City

Variable	Category	n	Percentage (%)
Chronotype	Evening type	30	29.1
	Intermediate type	56	54.4
	Morning type	17	16.5
Sleep Quality	Good	40	38.8
	Poor	63	61.2

Based on Table 2, it is known that the majority of respondents have an intermediate chronotype, namely 56 people (54.4%), followed by an evening chronotype of 30 people (29.1%) and a morning chronotype of 17 people (16.5%). These results indicate that the majority of adolescents at SMA Negeri 8 Jambi City have a tendency towards biological rhythms that are between morning and evening types. Meanwhile, the majority of respondents also have poor sleep quality, namely 63 people (61.2%), while respondents with good sleep quality are 40 people (38.8%). These findings indicate that more than half of adolescents at SMA Negeri 8 Jambi City experience poor sleep quality, which has the potential to affect their health conditions and daily learning activities.

Bivariate Analysis

Table 3. Frequency Distribution of the Relationship between Chronotype and Sleep Quality of Adolescents at State Senior High School 8, Jambi City

Chronotype	Good Sleep Quality n (%)	Poor Sleep Quality n (%)	Total (n)	p-value	Cramer's V
Evening Type	7 (23.3%)	23 (76.7%)	30	0.020	0.276
Intermediate Type	22 (39.3%)	34 (60.7%)	56		
Morning Type	11 (64.7%)	6 (35.3%)	17		
Total	40 (38.8%)	63 (61.2%)	103		

Based on Table 3, adolescents with an evening chronotype mostly had poor sleep quality, namely 23 respondents (76.7%), followed by an intermediate chronotype of 34 respondents (60.7%), while in the morning chronotype the majority of respondents had good sleep quality, namely 11 respondents (64.7%). These results show a tendency that the more towards the evening chronotype, the proportion of adolescents with poor sleep quality increases, while adolescents with a morning chronotype tend to have better sleep quality. The results of the Chi-Square test showed a p value = 0.020 ($p < 0.05$) which means there is a significant relationship between chronotype and sleep quality of

adolescents at SMA Negeri 8 Jambi City, with a Cramer's V value = 0.276 which indicates the strength of the relationship is in the weak category.

Discussion

The results showed that the majority of respondents were 17 years old (42 respondents (40.8%)), followed by 16 years old (28 respondents (27.2%)), 15 years old (27.2%), and 18 years old (6 respondents (5.8%)), so the majority were in middle adolescence. According to the WHO, adolescents are individuals aged 10–19 who are in a critical developmental period with biological and psychosocial changes that can affect sleep patterns and chronotype (Organization, 2023). During this phase, a shift in chronotype toward evening behavior often occurs, resulting in adolescents tending to sleep later and having shorter sleep durations on school days (Saxvig et al., 2021). This condition can lead to social jetlag, a mismatch between the biological clock and the morning school schedule, which impacts adolescents' sleep duration (Evanger et al., 2023).

Gender distribution showed that the majority of respondents were female (62 respondents (60.2%)) and male (41 respondents (39.8%)). Gender is known to influence sleep patterns and chronotype, with women tending to have an earlier chronotype than men (Wang et al., 2023). However, women are reported to be more susceptible to sleep quality disorders, which are influenced by hormonal factors as well as psychosocial factors such as academic pressure and evening social media use (Maulinda et al., 2025). Furthermore, research also shows that adolescent boys tend to be more evening chronotypes than girls (Fischer et al., 2017).

Based on the research results in Table 3, it is known that the distribution of adolescent chronotypes at SMA Negeri 8 Jambi City is dominated by intermediate types with 56 respondents (54.4%), followed by evening types with 30 respondents (29.1%), and morning types with 17 respondents (16.5%), indicating that most adolescents have a biological time tendency that is between the morning type and the evening type. This dominance of intermediate types is in line with various international studies showing that most adolescents do not have extreme circadian preferences, while morning types are the least common group (Paciello et al., 2022). Research in Indonesia also found a similar pattern, where intermediate types are the largest group followed by evening types and morning types as the smallest group (Fathurahman et al., 2025). However, the proportion of evening types reaching 29.1% still needs attention because various studies have shown

that this chronotype is associated with the risk of poorer sleep quality, shorter sleep duration, and increased health and behavioral problems in adolescents (M. Q. Zhu et al., 2023). The low proportion of morning types is also in accordance with the biological characteristics of the adolescent phase which experiences a shift in circadian rhythm towards eveningness due to hormonal changes during puberty, so that morning types become a minority group at this age (Saxvig et al., 2021).

Based on Table 2, the majority of respondents, 63 (61.2%), reported poor sleep quality, while 40 (38.8%) reported good sleep quality. These results indicate that more than half of adolescents at SMA Negeri 8 in Jambi City experience inadequate sleep quality. This finding aligns with the 2018 Basic Health Research (Riskesdas), which reported that sleep disorders are a fairly common health problem among adolescents in Indonesia (RI, 2018). Siregar's (2023) study of high school students in Jambi City also showed a prevalence of poor sleep quality of 64.1%, particularly among adolescents with high smartphone use. Hemas et al. (2022) found that 63% of adolescents experienced poor sleep quality, with late bedtimes and a sleep duration of only 3–5 hours per night (Makrina et al., 2022). This condition is influenced by biological factors, such as shifts in circadian rhythms during puberty, which make adolescents tend to sleep later, while the demands of waking up early for school lead to chronic sleep deficits (Stephanie J. Crowley, Amy R. Wolfson, Leila Tarokh, 2018). In addition, behavioral factors such as poor sleep hygiene ($r = 0.598$; $p < 0.001$) (Anggraini et al., 2025) and nighttime social media use associated with insomnia ($p < 0.05$)⁷¹ contribute to worsening adolescent sleep quality.

Globally, this phenomenon was also found in a study by Lemke et al. (2023) of 8,449 adolescents in Sweden, which showed that approximately 46% of adolescents slept less than eight hours on school days and poor sleep quality was associated with an increased risk of depression ($OR = 0.327$; $p < 0.0001$) (Lemke et al., 2023). Therefore, the high proportion of poor sleep quality in this study indicates the need for attention from health workers, educators, and parents to encourage the implementation of better sleep hygiene in adolescents. The results of the study showed a significant relationship between chronotype and sleep quality in adolescents at SMA Negeri 8 Jambi City with a p value = 0.020 ($p < 0.05$) and a weak relationship strength (Cramer's $V = 0.276$). Cross-tabulation analysis showed a pattern that the more evening chronotype tends, the proportion of poor sleep quality increases, namely 76.7% in evening types, 60.7% in intermediate types, and 35.3% in morning types. This finding is in line with the study of

Zhu et al. who found a negative correlation between chronotype and sleep quality ($r = -0.33$; $p < 0.001$), indicating that a tendency towards eveningness is associated with poorer sleep quality (Y. Zhu et al., 2023). The study of Rodríguez Ferrante et al. also reported that adolescents with an evening chronotype had a 1.38 times greater risk of experiencing poor sleep quality compared to morning chronotypes (OR = 1.38; 95% CI: 1.12–1.70; $p < 0.01$) (Rodríguez et al., 2024), while Khaira et al. found that evening type PSQI scores were significantly higher than morning type (8.14 ± 1.670 vs. 5.20 ± 1.842 ; $p = 0.001$) (Khaira et al., 2025).

This relationship can be explained by a shift in circadian rhythms in evening type adolescents that causes later bedtimes while school schedules require waking up earlier, thus causing the phenomenon of social jetlag and chronic sleep deficits (Illingworth et al., 2025). In addition, exposure to blue light from electronic devices at night can also suppress melatonin production and worsen sleep latency (Ípar, 2024). Although intermediate types are theoretically more flexible with their sleep schedules, this study shows that 60.7% of adolescents in this group still have poor sleep quality, which is likely influenced by behavioral factors such as poor sleep hygiene and gadget use at night (Anggraini et al., 2025). Therefore, this finding confirms that chronotype is one of the factors related to adolescent sleep quality, so that interventions to improve sleep quality need to consider differences in biological rhythms and sleep behavior habits in adolescents.

Limitations of this study include the lengthy permitting process and scheduling of data collection at schools due to the busy learning environment. Furthermore, the study focused solely on the relationship between chronotype and sleep quality, meaning other variables that could influence adolescent sleep quality, such as device use, stress levels, workload, and sleep environment, were not fully controlled. Data collection using questionnaires also has the potential to introduce subjective bias because it relies on the respondents' accuracy and understanding.

CONCLUSION

Based on the results of the analysis of the relationship between chronotype and sleep quality in adolescents at SMA Negeri 8 Jambi City, it can be concluded that the majority of respondents were 17 years old, as many as 42 people (40.8%) and most of them were female, as many as 62 people (60.2%). The distribution of chronotypes shows that most adolescents have an intermediate chronotype, namely 56 respondents (54.4%),

followed by an evening chronotype of 30 respondents (29.1%) and a morning chronotype of 17 respondents (16.5%). From the aspect of sleep quality, the majority of respondents have poor sleep quality, namely 63 respondents (61.2%), while good sleep quality is as many as 40 respondents (38.8%).

The results of the statistical analysis show that there is a significant relationship between chronotype and sleep quality in adolescents with a p-value of 0.020 ($p < 0.05$) and a Cramer's V value of 0.276 which indicates the strength of the relationship in the weak category. These findings indicate a tendency for adolescents with an evening chronotype to experience poorer sleep quality compared to adolescents with a morning chronotype. Based on the research results, it is recommended that public high schools in Jambi City, particularly teachers and guidance counselors, play an active role in educating students about the importance of healthy sleep patterns according to their chronotypes and helping them balance learning activities, device use, and rest time.

Parents are also expected to pay more attention to and monitor their children's sleep habits and create a comfortable home environment for rest. Furthermore, future researchers are expected to add other variables that could potentially influence sleep quality, such as stress levels, physical activity, device use, and environmental factors with a wider scope of respondents. This research is also expected to provide additional scientific references for the Faculty of Medicine and Health Sciences, University of Jambi in developing learning, research, and health promotion programs related to adolescent sleep quality.

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