

SLEEP BEHAVIOUR AND PERCEIVED DAILY PERFORMANCE AMONG ADOLESCENTS IN LUDHIANA CITY

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ABSTRACT

Sleep plays a vital role in adolescents' physical, cognitive and emotional well-being. This exploratory study examined sleep behaviour and perceived daily performance among adolescents aged 16–19 years in Ludhiana City. Using a descriptive cross-sectional research design, data were collected from 51 respondents through a structured online questionnaire. Descriptive statistics, including percentages and mean scores, were used to analyse the data. The findings indicated that many adolescents reported sleeping fewer than the recommended hours, following delayed bedtime routines and frequently using digital devices before sleep. While most participants perceived their academic performance as average or good, many also reported occasional daytime fatigue, variations in concentration and fluctuations in productivity. The study further highlighted a gap between awareness of healthy sleep habits and actual sleep practices. The findings emphasise the importance of promoting sleep hygiene, responsible digital device use and healthy daily routines to support adolescents' overall well-being and perceived daily performance.

Keywords: Sleep behaviour, adolescents, daily performance, sleep hygiene, screen exposure.

INTRODUCTION

1.1 Introduction

Sleep is a fundamental biological process that plays a vital role in maintaining physical health, cognitive functioning, emotional well-being, and overall quality of life. It is an active restorative process during which the body repairs tissues, consolidates memories, regulates hormones, and restores energy required for effective daily functioning. Adequate sleep is particularly important during adolescence, a period characterised by rapid physical growth, brain development and increasing academic and social responsibilities. Healthy sleep supports attention, learning, emotional regulation and decision-making, whereas insufficient sleep has been associated with reduced concentration, impaired memory, daytime fatigue and decreased academic engagement.

Adolescence is also marked by biological changes in the circadian rhythm, resulting in a natural tendency to sleep later at night. When combined with early school timings, academic pressure and increased use of digital devices, many adolescents fail to obtain the recommended duration of sleep. Consequently, understanding sleep behaviour among adolescents has become increasingly important for educators, parents and healthcare professionals seeking to promote students' overall well-being and academic success.

1.2 Global Trends in Adolescent Sleep Behaviour

Over the past two decades, insufficient sleep among adolescents has emerged as a global public health concern. The American Academy of Sleep Medicine recommends that adolescents aged 13–18 years obtain **8–10 hours of sleep** each night for optimal physical, cognitive and emotional development. However, studies conducted across North America, Europe and Asia consistently report that a significant proportion of adolescents sleep fewer than the recommended hours, particularly on school nights.

Rapid technological advancement has further transformed adolescent sleep habits worldwide. Increased dependence on smartphones, social media, online gaming and video-streaming platforms has contributed to delayed bedtimes and reduced sleep duration. Following the COVID-19 pandemic, greater reliance on digital learning and prolonged screen exposure further altered sleep routines, making irregular sleep schedules increasingly common among young people. International research has linked inadequate sleep with poorer concentration, reduced academic productivity, emotional instability, increased stress and diminished overall well-being.

1.3 Factors Influencing Sleep Behaviour among Adolescents

Sleep behaviour during adolescence is influenced by a combination of biological, academic, technological, psychological and lifestyle factors.

Biological factors include natural hormonal changes and a delayed circadian rhythm, which cause adolescents to feel sleepy later at night while still requiring early morning wake-up times.

Academic factors, such as homework, examinations, coaching classes and extracurricular commitments, often encourage students to sacrifice sleep in favour of extended study hours. Increasing competition for higher education has further intensified these demands.

Technological factors have become equally influential. Smartphones, social networking platforms, online entertainment and gaming frequently extend screen exposure into late-night hours. In addition to occupying time that could otherwise be spent sleeping, prolonged exposure to blue light may delay the onset of sleep by suppressing melatonin secretion.

Psychological factors, including stress, anxiety and peer-related concerns, may also influence both sleep quality and sleep duration. Similarly, lifestyle practices such as irregular daily routines, limited physical activity, caffeine consumption and inconsistent sleeping schedules contribute to poor sleep hygiene.

The interaction of these factors shapes adolescents' sleep behaviour and may subsequently influence their cognitive functioning and daily performance.

1.4 Sleep Behaviour and Academic Functioning

Sleep plays an important role in learning and academic achievement. During sleep, the brain consolidates newly acquired information, strengthens memory and supports higher-order cognitive processes such as attention, reasoning and problem-solving. Consequently, students obtaining adequate sleep are generally better equipped to participate actively in classroom learning and maintain sustained concentration.

Conversely, insufficient sleep has been associated with reduced alertness, slower information processing, difficulty recalling learned material and increased daytime fatigue. Although these effects may not always be immediately reflected in examination scores, they can influence classroom engagement, learning efficiency and overall academic productivity. As academic success depends on multiple factors, sleep should be recognised as an important behavioural contributor to effective learning rather than the sole determinant of academic performance.

1.5 Indian Context and Research Gap

In India, increasing academic competition, widespread smartphone use and changing lifestyle patterns have significantly influenced adolescents' daily routines. Board examinations, competitive entrance tests and extended study schedules often encourage students to prioritise academic commitments over adequate sleep. Simultaneously, the growing use of digital devices has altered traditional bedtime routines, contributing to delayed sleep schedules among school-going adolescents.

Although awareness regarding adolescent health has increased, research exploring students' own perceptions of sleep behaviour remains relatively limited within the Indian school context. Existing studies have largely focused on sleep duration or academic outcomes, with comparatively fewer examining how adolescents perceive the relationship between sleep, daily functioning and academic engagement.

The present study seeks to address this gap by exploring the sleep behaviour of adolescents aged 16–19 years and examining their perceptions regarding the influence of sleep on concentration, productivity, memory and academic engagement. The findings are expected to contribute to a better understanding of adolescent sleep habits and highlight the importance of promoting healthy sleep practices among school-going students.

REVIEW OF LITERATURE

Research on adolescent sleep has expanded considerably over the past two decades, with growing evidence demonstrating that sleep plays a critical role in physical health, emotional well-being, cognitive functioning and academic success. The following review summarises major international and Indian studies relevant to the present research.

2.1 Sleep Duration and Adolescent Health

Adequate sleep is recognised as an essential requirement for healthy adolescent development. The American Academy of Sleep Medicine recommends that adolescents aged 13–18 years obtain **8–10 hours of sleep per night** to support optimal physical, emotional and cognitive functioning. Regular sleep within

the recommended range has been associated with improved attention, learning, memory, emotional regulation and overall health.

However, global evidence consistently indicates that a large proportion of adolescents fail to achieve the recommended sleep duration. According to the Centers for Disease Control and Prevention (CDC), nearly **73% of high school students** in the United States report obtaining less than the recommended amount of sleep on school nights. Insufficient sleep has been linked to poor mental health, reduced concentration, behavioural difficulties and lower academic engagement.

Owens et al. (2014) further emphasised that chronic sleep deprivation during adolescence represents a major public health concern and identified biological changes, electronic media use, caffeine consumption and early school schedules as significant contributors to inadequate sleep.

2.2 Digital Screen Exposure and Sleep Behaviour

The rapid growth of digital technology has significantly influenced adolescent sleep habits. Smartphones, social media platforms, online gaming and streaming services have become integral to adolescents' daily routines, often extending into late-night hours.

Research consistently indicates that excessive screen exposure before bedtime delays sleep onset, reduces total sleep duration and contributes to poorer sleep quality. Exposure to blue light emitted from electronic devices suppresses melatonin secretion and disrupts the body's natural sleep-wake cycle, resulting in delayed bedtimes and irregular sleep schedules.

International studies therefore recommend promoting healthy digital habits, including limiting screen exposure before bedtime and encouraging consistent sleep routines among adolescents.

2.3 Sleep Behaviour and Academic Functioning

A substantial body of research has examined the relationship between sleep and academic performance. Earlier work by Wolfson and Carskadon reported that shorter sleep duration, irregular sleep schedules and poor sleep quality were consistently associated with lower academic achievement and reduced classroom performance.

More recent evidence suggests that sleep quality may influence academic performance more consistently than sleep duration alone. A systematic review and meta-analysis by Dewald and colleagues found that while the relationship between sleep duration and grades is relatively small, better sleep quality demonstrates a more reliable association with academic performance and cognitive functioning.

Furthermore, reviews examining delayed school start times have shown improvements in attendance, classroom alertness, academic engagement and overall student well-being, highlighting the importance of adequate sleep for educational outcomes.

2.4 Indian Studies on Adolescent Sleep

Indian research has similarly reported increasing concerns regarding adolescent sleep behaviour. Studies conducted among school-going adolescents have observed that increasing academic pressure, coaching classes, extended study hours and growing smartphone use contribute to delayed bedtimes and reduced sleep duration.

Several Indian studies have reported associations between inadequate sleep and daytime fatigue, reduced concentration, stress and lower classroom participation. However, much of the existing research has primarily focused on medical or psychological outcomes rather than exploring adolescents' own perceptions regarding sleep and daily functioning.

Although awareness regarding sleep hygiene is gradually increasing, sleep education remains relatively limited within Indian school settings. Consequently, healthy sleep practices are often overlooked despite increasing academic and technological demands.

2.5 Research Gap

The literature clearly demonstrates that adolescent sleep is influenced by multiple biological, academic and technological factors and that inadequate sleep is associated with poorer cognitive functioning and overall well-being. Most previous studies, however, have focused primarily on sleep duration, sleep disorders or objective academic performance.

Comparatively fewer exploratory studies, particularly within the Indian school context, have examined adolescents' own perceptions regarding how sleep influences their concentration, memory, productivity and academic engagement. Additionally, limited research has considered the combined influence of bedtime routines, digital screen exposure and perceived daytime functioning among senior secondary school students.

The present study seeks to address this gap by exploring the sleep behaviour of adolescents aged 16–19 years and examining their perceptions regarding the relationship between sleep, daily functioning and academic engagement. The findings are expected to contribute to a better understanding of adolescent sleep habits and provide useful insights for educators, parents and school counsellors in promoting healthy sleep hygiene among adolescents.

RESEARCH METHODOLOGY

3.1 Research Design

The present study adopted an **exploratory and descriptive research design** to examine the sleep behaviour of adolescents and its perceived influence on daily functioning and academic engagement. An exploratory approach was considered appropriate as the study sought to understand adolescents' perceptions and behavioural patterns rather than establish causal relationships. The study employed a cross-sectional survey design, collecting data at a single point in time through a structured questionnaire.

3.2 Objectives of the Study

The study was guided by the following objectives:

1. **To examine the sleep behaviour of adolescents aged 16–19 years.**
2. **To explore adolescents' perceptions regarding the relationship between sleep behaviour, daily functioning and academic engagement.**

3.3 Research Questions

The study sought to answer the following questions:

1. What are the prevailing sleep patterns and bedtime habits among adolescents?
2. How do adolescents perceive the influence of sleep behaviour on their daily functioning and academic engagement?

3.4 Participants and Sampling

The study was conducted among **51 adolescents** between the ages of **16 and 19 years**. Participants were selected using the **convenience sampling technique**, as they were readily accessible to the researcher. The sample included students from senior secondary classes who voluntarily participated in the study.

As the study was exploratory in nature, the selected sample was considered appropriate for obtaining preliminary insights into adolescent sleep behaviour and perceptions.

3.5 Research Instrument

Data were collected using a structured questionnaire designed by the researcher after reviewing relevant literature on adolescent sleep behaviour.

The questionnaire consisted of five sections:

- Demographic information
- Sleep behaviour and bedtime routines
- Digital screen usage before sleep
- Daily functioning and academic engagement
- Perceptions regarding sleep and performance (5-point Likert scale)

The questionnaire included a combination of multiple-choice questions and Likert-scale statements to capture both behavioural patterns and participants' perceptions.

3.6 Data Collection Procedure

The questionnaire was administered online using **Google Forms**. Participation was voluntary, and respondents were informed about the academic purpose of the study before completing the survey. Confidentiality and anonymity were maintained throughout the research process, and no personally identifiable information was collected.

The completed responses were compiled into a spreadsheet for analysis.

3.7 Data Analysis

The collected data were analysed using **descriptive statistical techniques**.

The analysis included:

- Percentage distribution for demographic and questionnaire responses.
- Mean scores for Likert-scale statements.
- Descriptive age-wise and gender-wise comparisons.
- Interpretation of emerging behavioural patterns related to sleep habits, screen exposure and perceived daily functioning.

As the study was exploratory, inferential statistical techniques were not employed.

3.8 Ethical Considerations

The study adhered to basic ethical principles throughout the research process. Participation was voluntary, and respondents were informed about the purpose of the study before completing the questionnaire. Confidentiality and anonymity of all participants were maintained, and the information collected was used solely for academic purposes. Participants were free to discontinue their participation at any stage without any obligation.

RESULTS AND DISCUSSION

4.1 Demographic Profile of Participants

The study included **51 adolescents aged 16–19 years**. The largest proportion of respondents (45.1%) were 16 years old, followed by 19-year-olds (25.5%), while participants aged 17 and 18 years constituted 15.7% and 13.7%, respectively. Female respondents represented 74.5% of the sample, males 23.5%, and 2.0% preferred not to disclose their gender.

Table 4.1

Demographic Profile of Participants (N = 51)

Variable	Category	Percentage (%)
Age	16 years	45.1
	17 years	15.7
	18 years	13.7
	19 years	25.5
Gender	Female	74.5
	Male	23.5
	Prefer not to say	2.0

The sample primarily represents adolescents in senior secondary education, making it appropriate for exploring sleep behaviour and its perceived impact on academic functioning.

4.2 Sleep Behaviour of Adolescents

The findings indicate that reduced sleep duration and delayed bedtime are common among respondents. The largest proportion of students (43.1%) reported sleeping **5–6 hours** on weekdays, while only about one-third achieved **7–8 hours** of sleep. A delayed sleep schedule was also evident, with the majority reporting bedtime after **11:00 p.m.**

Although many participants reported relatively short sleep duration, most rated their sleep quality as **moderate or good**. This suggests that adolescents may evaluate sleep quality based on how rested they feel rather than on the actual number of hours slept.

Table 4.2
Summary of Sleep Behaviour

Sleep Indicator	Predominant Response
Sleep Duration	5–6 hours
Bedtime	After 11:00 PM
Sleep Quality	Moderate to Good
Sleep Schedule	Moderately consistent

These findings indicate that insufficient sleep has become a routine feature of adolescent lifestyles rather than an occasional occurrence.

4.3 Digital Habits and Sleep Hygiene

Bedtime screen exposure emerged as one of the strongest behavioural patterns observed in the study. Nearly four out of five respondents reported using digital devices **often or always** before going to sleep.

This pattern was observed across all age groups, suggesting that mobile phones and other digital devices have become an integral part of adolescents' nighttime routines. Given the close relationship between screen exposure and delayed bedtime, the findings highlight digital habits as an important area for promoting healthier sleep behaviour.

4.4 Daytime Functioning and Academic Engagement

Many respondents reported experiencing daytime fatigue despite perceiving their academic performance as satisfactory. Feeling physically or mentally drained **sometimes** was the most common response, while nearly half of the participants also reported **occasional difficulty recalling information** during study or classroom activities.

Interestingly, the majority rated their academic engagement as **good** and their overall academic performance as **average**. This suggests that inadequate sleep may first influence concentration, alertness and memory before affecting students' perception of academic achievement.

Table 4.3
Daytime Functioning

Variable	Predominant Response
Daytime Fatigue	Sometimes
Academic Engagement	Good
Memory Recall Difficulty	Sometimes
Academic Performance	Average

The findings indicate that the effects of inadequate sleep are perceived more strongly in cognitive functioning than in overall academic performance.

4.5 Age-wise Patterns

Age-wise analysis revealed meaningful differences in sleep behaviour.

Older adolescents, particularly those aged **19 years**, reported later bedtimes more frequently than younger respondents. In contrast, students aged **16 years** demonstrated comparatively more structured bedtime routines, although many still reported insufficient sleep duration. Frequent bedtime screen use was observed across all age groups, indicating that digital engagement is widespread irrespective of age. However, the tendency towards delayed sleep schedules appeared to increase with age, possibly reflecting greater academic responsibilities, coaching commitments and increased independence in managing daily routines. These observations suggest that sleep behaviour may gradually become less structured during late adolescence.

4.6 Gender-wise Patterns

Descriptive comparison by gender indicated only modest differences.

Female respondents most commonly reported experiencing daytime fatigue **sometimes**, whereas a slightly greater proportion of male respondents reported feeling tired **often or always**. However, because male respondents represented a much smaller proportion of the sample, these observations should be interpreted with caution.

Both male and female participants reported high levels of bedtime screen use, suggesting that digital device usage before sleep is a common behaviour regardless of gender.

Overall, sleep-related challenges appeared to be shared across both genders, with differences being relatively small.

4.7 Patterns Across Variables

Although the study did not employ inferential statistical techniques, several meaningful descriptive relationships emerged.

Sleep Duration and Daytime Fatigue

Participants reporting shorter sleep duration also tended to report experiencing daytime tiredness more frequently. This pattern suggests that reduced sleep may influence daily energy levels and overall well-being.

Screen Exposure and Bedtime

Frequent bedtime screen use coincided with delayed sleeping hours for many respondents. This observation indicates that prolonged digital engagement may contribute to postponing sleep.

Sleep and Academic Functioning

Students experiencing disrupted routines commonly reported moderate changes in academic engagement and occasional difficulty concentrating during study. These findings suggest that sleep-related behaviours may influence attention and classroom engagement more readily than academic grades.

Awareness and Behaviour

Despite widespread awareness that daily habits influence performance, many respondents continued to report behaviours associated with inadequate sleep, indicating a gap between knowledge and practice.

4.8 Perceptions Regarding Daily Performance

Table 4.4
Mean Scores of Perceptual Statements

Statement	Mean Score
Awareness that daily habits affect performance	4.00
Managing academics varies from day to day	3.66
Daily focus varies	3.55
Productivity varies across days	3.51
Evening routines influence the next day	3.22

The highest mean score ($M = 4.00$) indicates that respondents strongly recognised the influence of daily habits on overall performance. However, the comparatively lower score for evening routines suggests that while adolescents acknowledge the importance of healthy habits in general, they may underestimate the specific impact of bedtime practices on next-day functioning.

4.9 Discussion

The present study highlights that insufficient sleep and delayed bedtime have become common among adolescents. Despite reporting shorter sleep duration than generally recommended, many participants

perceived their sleep quality as satisfactory, suggesting that inadequate sleep may have become normalised.

Another significant finding was the widespread use of digital devices before bedtime. High levels of screen exposure across age groups indicate that technology has become deeply integrated into adolescents' evening routines and may contribute to delayed sleep timing.

The study further suggests that reduced sleep influences cognitive aspects such as concentration, memory and daytime alertness more noticeably than perceived academic performance. Students appeared capable of maintaining satisfactory academic outcomes despite experiencing fluctuations in attention and energy, possibly reflecting adaptation to demanding academic environments.

Finally, the findings reveal an important awareness-behaviour gap. Although respondents recognised that daily habits influence performance, many continued to report lifestyle practices associated with poor sleep hygiene. This highlights the need for greater emphasis on practical sleep education, digital wellness and healthy routine formation among adolescents.

CONCLUSION AND RECOMMENDATIONS

5.1 Summary of the Study

Sleep plays a fundamental role in maintaining adolescents' physical health, cognitive functioning, emotional well-being and academic engagement. Recognising the increasing concerns surrounding inadequate sleep among adolescents, the present exploratory study aimed to examine the sleep behaviour of adolescents aged 16–19 years and explore their perceptions regarding the relationship between sleep, daily functioning and academic engagement.

The study was conducted using a structured questionnaire administered through Google Forms. A total of **51 adolescents** participated in the study using a convenience sampling technique. Data were analysed using descriptive statistics, including percentage distributions, mean scores and descriptive age-wise and gender-wise comparisons.

The findings indicated that a considerable proportion of respondents reported sleeping fewer hours than the recommended duration, with many following delayed bedtime routines. Bedtime screen exposure emerged as one of the most common behavioural patterns among participants. Although most respondents perceived their academic performance to be average or good, many also reported experiencing occasional daytime fatigue, variations in concentration and fluctuations in productivity. The findings further revealed that respondents generally recognised the importance of healthy daily habits; however, this awareness was not always reflected in their own sleep practices.

Overall, the study highlights the growing importance of healthy sleep habits during adolescence and reinforces the need for greater awareness regarding sleep hygiene in educational settings.

5.2 Conclusion

The present study demonstrates that sleep behaviour has become an important lifestyle concern among adolescents. The findings indicate that reduced sleep duration, delayed bedtime and frequent use of digital devices before sleep are common practices among the participants. These behavioural patterns reflect the changing lifestyle of today's adolescents, where academic commitments and digital engagement often extend into late-night hours.

An important observation emerging from the study is that the effects of inadequate sleep appear to be more evident in daily cognitive functioning than in perceived academic performance. Many respondents reported experiencing occasional daytime tiredness, variations in focus, difficulty recalling information and changes in productivity despite considering their academic performance to be satisfactory. This suggests that adolescents may continue to meet academic expectations while simultaneously experiencing subtle declines in attention, alertness and learning efficiency.

The study also revealed a noticeable gap between awareness and behaviour. Although respondents generally acknowledged that healthy daily habits influence overall performance, many continued to report bedtime routines that may contribute to insufficient sleep. This finding suggests that awareness alone may not be sufficient to encourage healthy behavioural practices. Practical guidance, supportive environments and consistent routines are equally important in promoting healthy sleep habits.

The age-wise observations indicated a tendency towards later bedtimes among older adolescents, whereas bedtime screen exposure was consistently high across all age groups. Gender-wise comparisons revealed only modest differences, suggesting that sleep-related challenges are experienced by both male and female adolescents.

As an exploratory study, the findings should not be interpreted as establishing cause-and-effect relationships. Nevertheless, they provide valuable insights into adolescents' perceptions of sleep and its influence on everyday functioning. The study emphasises that healthy sleep should be recognised not only as a health behaviour but also as an important contributor to learning readiness, emotional well-being and overall quality of life.

Promoting healthy sleep habits requires collaborative efforts involving students, parents, educators and schools. Encouraging balanced daily routines, responsible technology use and greater awareness regarding sleep hygiene can help adolescents develop healthier lifestyle practices that support both academic success and personal well-being.

5.3 Recommendations

Based on the findings of the study, the following recommendations are proposed:

For Students

- Maintain a regular sleep schedule by going to bed and waking up at consistent times.
- Aim to obtain the recommended 8–10 hours of sleep each night.
- Reduce the use of smartphones and other digital devices at least 30–60 minutes before bedtime.
- Balance academic responsibilities with adequate rest and recreation.
- Incorporate regular physical activity and relaxation techniques into daily routines to promote better sleep quality.

For Parents

- Encourage healthy bedtime routines and monitor excessive screen use during late evening hours.
- Create a supportive home environment that values adequate sleep alongside academic achievement.
- Discuss the importance of sleep hygiene with adolescents and encourage balanced daily schedules.

For Schools

- Integrate sleep hygiene and digital wellness into life skills or health education programmes.
- Organise awareness sessions on healthy lifestyle practices for students and parents.
- Encourage effective time management strategies that help students balance academic responsibilities with adequate rest.
- Promote student well-being through counselling initiatives that address stress management and healthy routines.

For Future Researchers

- Conduct similar studies using larger and more diverse samples to improve generalisability.
- Compare sleep behaviour across different regions, school systems or socioeconomic groups.
- Examine additional factors such as mental health, physical activity, dietary habits and academic stress in relation to adolescent sleep.
- Employ longitudinal or mixed-method research designs to gain deeper insights into changing sleep behaviours over time.

5.4 Limitations of the Study

While the present study provides useful insights into adolescent sleep behaviour, certain limitations should be acknowledged.

The study was conducted using a relatively small sample of 51 participants selected through convenience sampling, limiting the generalisability of the findings. Data were based on self-reported responses and

therefore may have been influenced by participants' perceptions or recall bias. The cross-sectional nature of the study reflects behaviours at a single point in time and does not permit conclusions regarding causal relationships. Furthermore, the study employed descriptive statistical analysis only and did not include inferential statistical techniques to examine associations between variables.

Despite these limitations, the study provides valuable preliminary evidence regarding adolescents' sleep behaviour and contributes to understanding their perceptions of how sleep influences daily functioning and academic engagement.

REFERENCES

1. American Academy of Pediatrics. (2014). *School start times for adolescents*. *Pediatrics*, 134(3), 642–649. <https://doi.org/10.1542/peds.2014-1697>
2. Carskadon, M. A. (2011). Sleep in adolescents: The perfect storm. *Pediatric Clinics of North America*, 58(3), 637–647. <https://doi.org/10.1016/j.pcl.2011.03.003>
3. Centers for Disease Control and Prevention. (2024). *Sleep and health*. <https://www.cdc.gov/physical-activity-education/staying-healthy/sleep.html>
4. Centers for Disease Control and Prevention. (2024). *About sleep*. <https://www.cdc.gov/sleep/about/index.html>
5. Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage Publications.
6. Dewald, J. F., Meijer, A. M., Oort, F. J., Kerkhof, G. A., & Bögels, S. M. (2010). The influence of sleep quality, sleep duration and sleepiness on school performance in children and adolescents: A meta-analytic review. *Sleep Medicine Reviews*, 14(3), 179–189. <https://doi.org/10.1016/j.smrv.2009.10.004>
7. Hale, L., & Guan, S. (2015). Screen time and sleep among school-aged children and adolescents: A systematic literature review. *Sleep Medicine Reviews*, 21, 50–58. <https://doi.org/10.1016/j.smrv.2014.07.007>
8. Hirshkowitz, M., Whiton, K., Albert, S. M., et al. (2015). National Sleep Foundation's sleep time duration recommendations: Methodology and results summary. *Sleep Health*, 1(1), 40–43. <https://doi.org/10.1016/j.sleh.2014.12.010>
9. Kothari, C. R. (2004). *Research methodology: Methods and techniques* (2nd ed.). New Age International Publishers.
10. Kumar, R. (2019). *Research methodology: A step-by-step guide for beginners* (5th ed.). Sage Publications.
11. Lemola, S., Perkinson-Gloor, N., Brand, S., Dewald-Kaufmann, J., & Grob, A. (2015). Adolescents' electronic media use at night, sleep disturbance and depressive symptoms. *Journal of Youth and Adolescence*, 44(2), 405–418. <https://doi.org/10.1007/s10964-014-0176-x>
12. Ministry of Education, Government of India. (2020). *National Education Policy 2020*.
13. National Council of Educational Research and Training. (2023). *Adolescent education programme*.
14. Owens, J. A., Adolescent Sleep Working Group, & Committee on Adolescence. (2014). Insufficient sleep in adolescents and young adults: An update on causes and consequences. *Pediatrics*, 134(3), e921–e932. <https://doi.org/10.1542/peds.2014-1696>
15. Paruthi, S., Brooks, L. J., D'Ambrosio, C., et al. (2016). Recommended amount of sleep for pediatric populations: A consensus statement of the American Academy of Sleep Medicine. *Journal of Clinical Sleep Medicine*, 12(6), 785–786. <https://doi.org/10.5664/jcsm.5866>
16. Short, M. A., Gradisar, M., Gill, J., & Camfferman, D. (2013). The impact of sleep on adolescent depressed mood, alertness and academic performance. *Journal of Adolescence*, 36(6), 1025–1033.
17. Tarokh, L., Saletin, J. M., & Carskadon, M. A. (2016). Sleep in adolescence: Physiology, cognition and mental health. *Neuroscience & Biobehavioral Reviews*, 70, 182–188.
18. UNICEF. (2021). *The State of the World's Children 2021: On my mind – Promoting, protecting and caring for children's mental health*.
19. World Health Organization. (2024). *Adolescent health*. <https://www.who.int/health-topics/adolescent-health>
20. Wolfson, A. R., & Carskadon, M. A. (2003). Understanding adolescents' sleep patterns and school performance. *Sleep Medicine Reviews*, 7(6), 491–506.