



Investigating The Impact of a School Based Sleep Promotion Initiative on Adolescents' Sleep Hygiene, Quality, And Daytime Functioning

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ABSTRACT

A good night's sleep is crucial to our survival. Puberty brings about a lot of changes, one of which is that teens want to stay up longer than their parents did. This is mostly due to their increased internet use. Teens' lack of good sleep hygiene is a major contributing factor to their inability to obtain the recommended amount of sleep each night, which is eight to ten hours. Because of continual changes in lifestyle, stress is becoming increasingly common among both adults and children. The adolescent years are full of ups and downs, and if they aren't careful, the stress and strain of the time could ruin their sleep, which in turn affects their health and academic performance. Young individuals are fully capable of influencing the biological and behavioral factors that contribute to sleep timing delays, inconsistent sleep-wake patterns, and short sleep durations (<7 h) on school days. A 50-minute action was important for the sleep hygiene customized consistently for seven days. A portion of the exercises incorporated a sleep physiology address, making a sleep ontogeny map, discussing the reasons and impacts of teenagers not getting sufficient sleep, and a test on sleep hygiene proclamations. This brought about the understudies' sleep idleness diminishing, rest wake plans improving, and file of sleep inconsistency (standard deviation from sleep time) diminishing. They were similarly as sluggish during the day and had a similar quality of sleep. The modified improved rest getting up and diminished sleep inconsistency and dormancy, however it very well may be vastly improved with not many changes and a greater example size.

Keywords: *Adolescence, Sleep Quality, Sleep-Hygiene, Sleep Hygiene Behavior, Sleep Education*

1. INTRODUCTION

Getting enough sleep is crucial for improving one's mental, emotional, and physical health and overall quality of life. Eight to ten hours of sleep per night is considered normal throughout puberty. Sleep disorders, sleep deprivation, or insomnia affect adolescents' ability to focus, study, and control their emotions. This, in turn, can lead to stress, emotional instability, and a lack of desire. This life stage, which lasts from around the age of 10 to about the age of 19, is known as adolescence. As a person grows from childhood into maturity, adolescence is a time of profound change and gradual transition. During this time, they also develop the majority of their routines and behaviors. Adolescents with severe insomnia make up about 16% of the population. The erratic sleeping habits of students are well-known. Schedules like this, coupled with other typical student habits like drinking and using caffeine, are linked to bad sleep hygiene. So, it's critical to control their sleep habits and make sure they get enough good sleep for optimal development and wellness. A sleep disorder is described by the International Council on Sleep Disorders (ICSD) as poor sleep hygiene, which occurs when a person's regular activities conflict with the maintenance of high-quality sleep (Indian academy of sleep medicine, 2017).

In clinical populations, researchers have shown that enhancing sleep hygiene knowledge and behaviors effectively treats insomnia. Nevertheless, studies including nonclinical samples and the correlation between sleep hygiene behaviors, overall sleep quality, and reliability of measurements have yielded contradictory results. Six percent to 37 percent of teenagers in a survey of school-aged children from Asia, Europe, and the United States had trouble with normal sleep quality across multiple behavioral characteristics of sleep quality, including falling asleep, sleeping undisturbed and overall sleep duration. There has been a recent uptick in research showing that gaming addiction and mobile phone addiction are negatively impacting people's ability to get a good night's sleep and making them drowsy during the day. Researchers found that people whose social media use was higher also tended to sleep less. Research has shown that good sleep hygiene is a strong indicator of a good night's rest. Every aspect of a person's day-to-day functioning is impacted by their sleep hygiene. There is a dearth of literature on the topic of teenage sleep habits and quality in India. Few researches have looked at how teenagers in South India maintain good sleep hygiene. Additionally, it is necessary to determine the frequency of sleep hygiene practices among teenagers in Coimbatore, which is a region of Tamil Nadu and is home to numerous educational institutions. This study aimed to examine the sleep habits and patterns of school-aged teenagers in semi-urban Coimbatore because good sleep hygiene is associated with better every day functioning. The study set out to investigate two things:(1) identify the sleep hygiene practices of teenagers in semi-urban Coimbatore, and (2) learn about their sleep patterns.

2. LITERATURE REVIEW

Hall & Nethery (2019) provided extensive descriptions of sleep hygiene practices. The effectiveness of intervention options based on sleep hygiene principles, as well as the links between specific components of sleep hygiene and certain sleep outcomes, were not clearly defined. Our goal in writing this review was to summarize key points from a larger study on sleep hygiene. We meticulously searched the following databases up until August 2017: Psycinfo, CINAHL, Cochrane, Ovid Medline,

Emblaze, and the Web of Science Search Engines. A total of 44 studies were considered for inclusion if they found any correlation between sleep hygiene (i.e., actions taken in the hours leading up to bedtime and while sleeping) and improvements in sleep duration, sleep onset latency, or night waking, or if they employed interventions centered on sleep hygiene to achieve these goals. Based on age group, factors related to sleep hygiene, and interventions, we classified our data into themes. Our recommendations are based on the best available research and address both the most pressing issues and those with the strongest empirical backing in the realm of sleep hygiene.

Vollmer (2017) was anticipated since this study examined youth sleep disorders; it seemed likely that youth eveningness direction was linked to sleep troubles. In a self-report poll, 3201 auxiliary school students (mean age = 13.8 ± 1.8 years) were asked about morning-evening routine, sleep time (including social "jetlag"), sleep length (both on school days and weekends), sleep quality, hygiene, and screen media use. We examined how circadian inclination affected youths' sleep duration (both on schooldays and weekends) and sleep hygiene practices using staggered examinations that controlled for understudy level and class-level covariates (age, sex, screen media use, and time spent away from home). Morning-eveningness significantly impacted all dependent characteristics, with strongest correlations ($\beta > 0.40$) observed for mid-sleep, social jetlag, sleep difficulties, difficulty falling asleep, and difficulty regaining alertness. Parents should be informed on how to schedule their children's sleep hygiene, implement an educational customized on the point, and delay school start times to better adjust their circadian rhythms to academic and social demands.

John et al. (2017) researched the impacts of a sleep promotion programmed (SPP) on juvenile sleep hygiene, sleep quality, daytime tiredness, and current working. This examination used a two-arm plan with equal group randomization. There were 660 youngsters required, with 330 assigned to the exploratory gathering and 400 to the benchmark group. Normalized polls were used related to a socio-segment overview that remembered inquiries for action and sleep. At about fourteen days, the exploratory gathering showed huge expansions in sleep hygiene rehearses. At about a month and a half, they showed huge enhancements in all out sleep quality and its sub-parts, including emotional sleep quality, sleep idleness, and sleep effectiveness. Also, at about a month and a half, they showed huge upgrades in daytime sluggishness. When contrasted with the benchmark group, there was no measurably huge distinction in other sleep quality parts including term of sleep, sleep aggravation, daytime brokenness, or present working. The objective sleep factors showed genuinely critical positive connections. Young people's sleep hygiene commonly declines as they progress through the grades, while issues with sleep length, quality, and daytime tiredness deteriorate with age. SPP can possibly assist sound teens with growing better sleep propensities. Potential future mediations pointed toward improving emotional well-being merit further examination.

Casoff et al. (2013) found that sleep deprivation among adolescents is common in modern culture and has serious detrimental effects on their health and development. Efforts to decrease sleep restriction among adolescents using school-based sleep promotion programmed are examined in this review. Programmed like these are great for increasing people's sleep literacy, but they seldom manage to get people to stick to their new sleep habits. The significance of including motivating elements into the

programmed may not be well considered, which could explain this. They recommend that future interventions think about ways to promote sleep that are specific to each person. The advocate for the use of motivational interviewing because it can identify variances in people's levels of readiness to change and enable individualized approaches to overcome motivational obstacles. In addition, we propose that a large percentage of teenagers should benefit from receiving internet-based communication regarding personalized techniques to promote sleep.

Gruber (2013) the research and practice of psychology revolve around the three pillars of healthy adjustment: physical, cognitive, and emotional functioning. According to this, getting the right amount of sleep is essential for optimizing all three. On the flip side, these areas of life need to be healthy for maximum development, and when people aren't getting enough sleep or are too tired, it shows. Nonetheless, many youths fail to get enough sleep, either in terms of duration or temperature. Youth health and performance might benefit greatly from making good use of what is known about the significance of sleep in maximizing physical, cognitive, and emotional functioning. There is a present dearth of comprehensive translation of existing knowledge for the advantage of Canadian kids, despite the fact that optimum sleep health is essential. An important opportunity to enhance children's health and success by making better use of existing data is probably going unnoticed, so this is really important. Consequently, this article's goals are to (1) explain why sleep is important from a psychological perspective, (2) explain how sleep affects daytime functioning and development, (3) explain why it's necessary to create preventative sleep education programmed, and (4) identify the most significant obstacles to effective sleep education and how to overcome them.

3. RESEARCH METHODOLOGY

3.1 Participants

Research participants came from four different classes in India (05°46'S, 35°12'W). Out of the 200 students who were enrolled, a mere seventy-seven returned the parental consent forms. As a starting point, just seventy-one people returned the surveys. Of those who were surveyed after the programmed, just 59 (32.521%) provided feedback. Participants' ages ranged from 12.88 to 0.92, and the study was completed by 46 female and 13 male students. None of the volunteers suffered from a sleep condition, and their participation was entirely voluntary and unpaid. In accordance with the guidelines set out by the University Ethics Committee, permission forms outlining the study's methods were distributed to the parents and volunteers. The programmed could not begin until the University Ethics Committee and all participating schools gave its approval.

3.2 Procedures

1. A baseline assessment of sleep patterns and daytime drowsiness was performed.
2. A sleep hygiene education programmed was implemented.
3. After around one month of the programmed, participants were again evaluated for their sleep habits and daytime sleepiness.

The baseline and programmed effect evaluations took place over the same number of school days and during the same kinds of academic activities.

3.3 The Sleep Hygiene Program

Over the course of a week called "sleep hygiene week," students participated in the school's sleep hygiene programmed. The class time was fifty minutes every day. Although all students were involved in the programmed, only 59 of them had their data collected. The writers of this piece carried out the programmed and used several activities daily, as detailed below.

➤ Day One (Monday)

Questions on sleep, such as "How much sleep do we need?" were displayed on posters across the campus and in their classroom. We need to get some sleep, what can we do? The investigator visited each classroom on this day to brief the children on the upcoming events and solicit their participation.

➤ Day Two (Tuesday)

In order to talk about how the sleep-wake cycle changes as we get older, we drew an ontogeny map. Students worked in five different groups to create the ontogeny map. Each category recorded the typical sleeping habits of a certain age range: infant, child, adolescent, adult, and senior citizen. We wrapped up by talking about how sleep changes with age, especially throughout puberty, but also throughout life.

➤ Day Three (Wednesday)

This class exposition discusses the sleep-wake cycle's role, nature, and other characteristics.

➤ Day Four (Thursday)

We conducted a review on the study hall understudies' drowsiness, lethargy, inability to concentrate, memory problems, and negative emotional states. This campaign was started with the intention of raising youth awareness of the problems that are often associated with poor sleep. We then discussed the reasons behind and effects of low sleep duration.

➤ Day Five (Friday)

Our quiz included of statements about proper sleep hygiene. Pamphlets on proper sleep hygiene were given out to everyone, and at the conclusion of the competition, a pillow was given to a member of the team that had won. Answers to the questions that were asked on the first day of the programmed were exhibited next to the posters one week after the programmed had concluded.

3.4 Measures

Scores between 16 and 86 indicated a more evening type personality. Subsequently, the subjects were categorized as either moderate or extreme. The pupils were asked to fill out a questionnaire on their sleeping patterns both before and after the programmed.

Among the many topics covered by the sleep habits questionnaire are one's overall health, sleep patterns, and quality. This tool was modified from one that was effective with Indian teenagers. Students kept a sleep diary before and after the workshop to document their daily, morning, and nap schedules as an added precaution. Typical instruments in the sleep research toolkit include the autography, an activity tracker worn on the wrist, subjective sleep assessments, and self-reported data from a sleep diary. The level of drowsiness of the respondents was measured using a Portuguese version of the Epworth sleepiness scale (ESS), where a score of 10 was considered to be suggestive of exhaustion. Participants were administered this measure both prior to and post the training. The youngsters were asked to rate how well they felt they slept on both weekdays and weekends. As previously noted, a sleep-habits questionnaire was used to confirm the quality of sleep using a 10-centimeter visual-analog scale. As the score increased, the quality of sleep decreased. The first administration took place before the scheme began, and the second one after. We compared the sleep-patterns questionnaire with the phenotype categories using a Chi-square test to explain the sleeping habits of teenagers. The sleep habit questionnaire was administered as part of a pre- and post-sleep hygiene routine. Using a paired Student's t-test (t), we compared nap schedules, nocturnal sleep patterns, and sleep quality and latency. This made it possible for us to determine the program's effectiveness. The sleep-wake cycle irregularity index, which is determined by calculating the bedtime standard deviation, was also compared using the same methodology.

Table 1: Sleep Features, Epworth Sleepiness Scale Scores, And Sleep Quality Scores Of 58 Adolescents Before and After the Sleep Hygiene Programme

Features	Before (mean ± SD)	After (mean±SD)	p
Weekdays			
Bedtime (hh:mm)	22:20 ± 61 min	22.22 ± 48 min	ns
Wake up time (hh:mm)	05:46 ± 34 min	05.42 ± 32 min	ns
Time in bed	7.4 h ± 57 min	7.3 h ± 50 min	ns
Sleep quality	6.91 ± 2.51	6.61 ± 2.57	ns
Weekends			
bedtime (hh:mm)	23:47 ± 76 min	23.43 ± 77 min	ns
Wake up time (hh:mm)	09:15 ± 96 min	0.9:11 ± 91 min	ns
Time in bed	9.4 h ± 592 min	9.45 h ± 80 min	ns
Sleep quality	8.67 ± 1.95	8.0 ± 2.39	ns
Naps			
Frequency (%)	58.63	56.91	ns
Start	14.09 ± 86 min	13.57 ± 60	ns
End	16.07 ± 84 min	15.58 ± 72	ns
Duration	1 h 58 min ± 58 min	1 h 55 min ± 59 min	ns
Sleepiness	10.12 ± 3.46	9.99 ± 3.58	ns

kept track of in the sleep log. Wilcoxon test (T) was used to compare baseline and post-sleep hygiene programmed Epworth sleepiness scale ratings.

4. DATA ANALYSIS AND RESULTS

4.1 Sleep Hygiene Programme Impact

We measured the program's impact on drowsiness, sleep quality, and the sleep-wake cycle.

(a) Sleep–Wake Cycle

There were no statistically significant changes in the members' overnight sleep designs between the gauge and program-end sleep-propensities polls, as shown in Table 1. (Time spent sleeping: $t_{(56)} = -1.00$; time spent awakening: $t_{(56)} = -0.91$; time spent in bed: $t_{(56)} = 0.31$, $P > 0.06$). Consequently, the differences between school and end-of-week days were maintained by the understudies at sleep time (gauge: $t_{(54)} = -7.71$; $P < 0.02$; following the show: $t_{(56)} = -8.79$; $P < 0.01$), awoken time (benchmark: $t_{(55)} = -17.16$; $P < 0.02$; following the show: $t_{(56)} = -17.68$; $P < 0.01$), and time in bed (standard: $t_{(55)} = -8.50$; $P < 0.02$; following the show: $t_{(56)} = -9.76$; $P < 0.03$). Because they rise early, work hard, and go to bed on time, understudies typically get around two hours less sleep during the week than they would at the weekend. $X^2 = 184.88$; $P < 0.02$), the sleep duration was shorter on school days, suggesting a moderate pattern of expansion and contraction (71.41%), followed by moderate types during the morning (18.98%) and night (8.62%). the sleep expansion and decrease design linked to a shorter school day sleep span decreases the number of individuals who wake up alone (standard: 20.37%; $X^2 = 7.61$; $P < 0.05$; after the programme: 25.14%; $X^2 = 3.77$; $P > 0.05$). The sleep journals of 14 students showed a reduction in inconsistency, even though school and weekend sleep patterns are inconsistent ($t_{(13)} = 2.18$; $P < 0.05$) (Table 2). Additionally, post-program sleep inactivity was distinct. A decrease in sleep inactivity from 13.36 to 9.37 8.6 min ($t_{(12)} = 3.18$; $P < 0.02$) was seen in the understudy, indicating that they expended less effort to fall asleep.

Table 2: The Sleep Diary Revealed the Irregularity Indices of Eight Students (A)

	Before SD (h:mm)	After SD (h: mm)
A1	1:04	0:51
A2	0:45	0:53
A3	1:46	1:18
A4	1:00	0:51
A5	0:39	0:25
A6	1:25	1:32
A7	1:38	1:34
A8	1:39	1:46

* $P < 0.05$.

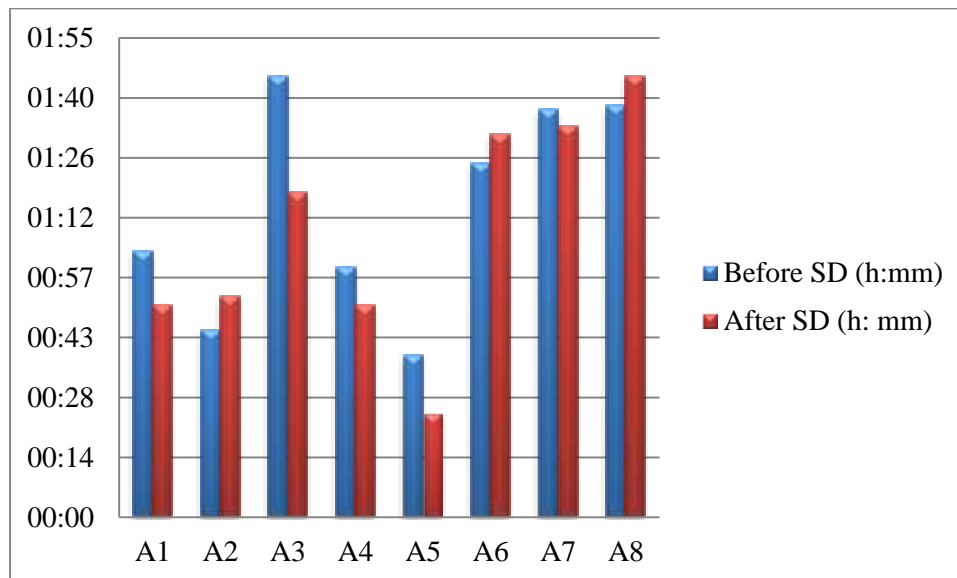


Figure 1: The Sleep Diary Revealed the Irregularity Indices of Eight Students (A)

(b) Sleepiness

We used the Epworth Sleepiness Scale (ESS) to measure how drowsy the subjects were. Table 1 show that there were no changes in the median ESS scores between the beginning and end of the programmed (T, P > 0.05). As part of the educational programmed, students were asked to reflect on their own sleep hygiene and the issues that often arise as a result of insufficient sleep. This self-evaluation lends credence to the results. Students reported drowsiness as their primary sleep issue, followed by fatigue, problems with focus and memorizing, and negative moods (Table 3). Therefore, it appears that the majority of students in this sample experience many sleep-related issues.

(c) Sleep quality

Week two's average sleep quality before and after the programme did not differ ($t_{(56)} = -1.23$; P > 0.05), nor did it differ on weekends ($t_{(56)} = -1.80$; P > 0.05). According to the students, at baseline ($t_{(56)} = 6.13$; P < 0.01) and after the programme ($t_{(56)} = 3.83$; P < 0.01), their sleep quality was better on weekends than on school days (Table 1).

Table 3: Sleep Issues During Hygiene Programme

Sleep Issues	Student (%)
Sleepiness	75.87
Tiredness	68.95
Memorization Difficulties	60.35
Concentration Difficulties	59.63
Bad Humor	32.76

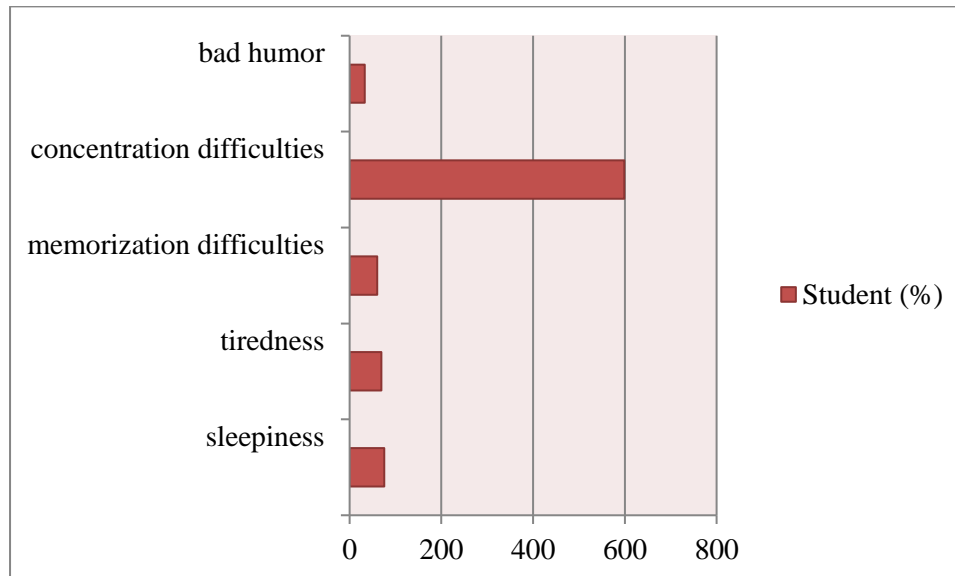


Figure 2: Sleep Issues During Hygiene Programme

5. DISCUSSION

A sleep hygiene customized that was planned and adjusted for use in schools was carried out determined to teach young people about the physiology of sleep, alongside the causes and results of short sleep, as well as the strategies engaged with rehearsing great sleep hygiene. From that point onward, teenagers would have the option to settle on a conscious choice with respect to the behavior that affects their everyday presentation and generally prosperity. Following cooperation in the modified, the young people saw a decrease in the abnormality file of sleep start, an improvement in their rest plan, and a decrease in their sleep dormancy. Furthermore, there was no genuinely huge contrast seen in different pointers, like diurnal sleepiness and sleep quality. The utilization of this program was made to a populace of young people who had unpredictable sleep propensities on school days and ends of the week. It is conceivable that unpredictable sleep cycles and decreased nighttime sleep on school days are factors that add to expanded diurnal sleepiness, which was seen by in excess of half of understudies notwithstanding sensations of exhaustion, issues with concentration, and difficulties with retention. Despite the fact that it is workable for young people to encounter diurnal sleepiness in any event, when they don't have a short sleep length, the presence of this peculiarity, which is connected to sensations of weariness, trouble with concentration and retention, and pessimistic humor, is related with a short sleep term. Oneself assessed more regrettable sleep quality that was accounted for on work days and the pervasiveness of rests on school days, which were seen something like once seven days in over two thirds of the youngsters between the long stretches of 14:09 and 16:06 h, could be ascribed to this.

6. CONCLUSION

During the Sleep seven day stretches of exercises, the great effects that were seen after the modified could be because of the behavior that was illustrated. Nonetheless, it is conceivable that these advantages were not sufficient to support the progressions that were expected. In a similar vein, the

lack of a reference group and the smaller student body could compromise the assessment of the program's outcomes. This is due to the fact that fewer students are enrolled as a result of the difficulties in following the information assortment policy. For this reason, it is essential to conduct an evaluation of a programme that is not only longer but also more advanced, and that is associated with information and practice on sleep, on a larger sample size that also includes a benchmark group. At the point when young people are in this time of improvement, they are permitted to get back later, show up for parties, utilize their folks' vehicle, and date, which are all exercises that assist them with shaping connections that will ultimately assist them with coordinating into society. This is the kind of thing that should be thought about. As a result of this, not all youngsters will be anxious to get rid of these side interests that they view as pleasant. Because of the way that youths are currently framing propensities and simply deciding, they are ideal focuses for the foundation of a culture that puts a high worth on the quality of sleep. Therefore, educational customized could be urged to make individuals mindful of their sleep-wake cycle. This is because of the way that the information acquired in school could be helpful not just for working on the quality of life of youths, yet additionally for working on the quality of life of grown-ups, including the foundation of good sleep propensities in their own youngsters. Most of the young people had a sleep design that went from moderate to superb, and they rehearsed great sleep hygiene. As far as age, most of people had moderate scores on the Sleep Pattern Index (SPI) and the Sleep Hygiene Index (SHI) in both the beneath and more than 15 years' gathering. By and large, showed better Sleep design records, while females showed predominant Sleep hygiene files. Sleep design records were viewed as extraordinary among teenagers going to government schools, however moderate sleep hygiene lists were found among young people going to non-public schools. Nonetheless, when examinations were made, the age, orientation, and kind of school showed no genuinely huge contrasts. When contrasted with understudies in the eighth, 10th, and twelfth classes, understudies in the 10th and twelfth classes had the most minimal SPI and SHI scores. This was the situation among understudies in the eighth through twelfth classes. In light of the discoveries of this review, it is suggested that school-based wellbeing education and mindfulness modified be carried out in schools. These customized ought to underline the meaning of suitable sleep hygiene rehearses and the antagonistic impacts that these behaviors have on wellbeing. It is important to do top to bottom exploration to distinguish the components that are profoundly associated with unfortunate sleep hygiene and behaviors to foster treatments that are fruitful.

REFERENCES

1. Adolescent health (no date) World Health Organization. World Health Organization. Available at: <https://www.who.int/health-topics/adolescent-health> (Accessed: January 3, 2023).
2. Asarnow LD, McGlinchey E, Harvey AG. The effects of bedtime and sleep duration on academic and emotional outcomes in a nationally representative sample of adolescents. *Journal of Adolescent Health*. 2014 Mar 1; 54(3):350-6.
3. Cassoff, J., Knäuper, B., Michaelsen, S., & Gruber, R. (2013). School-based sleep promotion programs: effectiveness, feasibility and insights for future research. *Sleep medicine reviews*,

- 17(3), 207-214.
4. Chehri A, Parsa L, Khazaie S, Khazaie H, Jalali A. Validation of the sleep hygiene index for the elderly. *Journal of public health*. 2021 Aug;29(4):787-93. Murugesan G, Karthigeyan L, Selvagandhi PK, Gopichandran V. Sleep patterns, hygiene and daytime sleepiness among adolescent school-goers in three districts of Tamil Nadu: A descriptive study. *The National medical journal of India*. 2018 Jul 1; 31(4):196-200.
 5. Gruber, R. (2013). Making room for sleep: The relevance of sleep to psychology and the rationale for development of preventative sleep education programs for children and adolescents in the community. *Canadian Psychology/psychologie canadienne*, 54(1), 62.
 6. Hall, W. A., & Nethery, E. (2019). What does sleep hygiene have to offer children's sleep problems? *Paediatric respiratory reviews*, 31, 64-74.
 7. John B. Sleep duration and sleep hygiene practices in adolescents: Age and gender differences. *Nitte University Journal of Health Science*. 2014 Dec 1;4(4):65
 8. John B. Sleep-patterns, sleep hygiene behaviors and parental monitoring among Bahrain-based Indian adolescents. *Journal of family medicine and primary care*. 2015 Apr;4(2):232.
 9. John, B., Bellipady, S. S., & Bhat, S. U. (2017). Sleep promotion program for improving sleep behaviors among adolescents in selected schools: a randomized controlled trial. *International Journal of Mental Health Promotion*, 19(2), 51-68.
 10. Kaur G, Singh A (2017) Sleep Hygiene, Sleep Quality and Excessive Daytime Sleepiness among Indian College Students. *J Sleep Med Disord* 4(1): 1076.
 11. Rafique N, Al-Asoom LI, Alsunni AA, Saudagar FN, Almulhim L, Alkaltham G. Effects of mobile use on subjective sleep quality. *Nature and science of sleep*. 2020; 12:357
 12. Sleep for teenagers (2022) Sleep Foundation. Available at: <https://www.sleepfoundation.org/teens-and-sleep> (Accessed: January 3, 2023).
 13. Sleep in Middle and high school students (2020) Centers for Disease Control and Prevention. Centers for Disease Control and Prevention. Available at: <https://www.cdc.gov/healthyschools/features/studentssleep.htm#:~:text=Importance%20of%20Sleep&text=The%20American%20Academy%20of%20Sleep,10%20hours%20per%2024%20hours> (Accessed: January 3, 2023)
 14. Vollmer, C., Jankowski, K. S., Díaz-Morales, J. F., Itzek-Greulich, H., Wüst-Ackermann, P., & Randler, C. (2017). Morningness-eveningness correlates with sleep time, quality, and hygiene in secondary school students: a multilevel analysis. *Sleep Medicine*, 30, 151-159.
 15. Xie X, Dong Y, Wang J. Sleep quality as a mediator of problematic smartphone use and clinical health symptoms. *Journal of behavioral addictions*. 2018 Jun; 7(2):466-72.