International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

A Study to Assess the Effectiveness of Educational Program on the Level of Knowledge Andattitude Regarding Sleep Hygiene of Students Among the High School Students in Selectedhigh School, Guwahati, Assam

Ms. Puspasana Yumnam[1], Mr. Pamei Jeanpudai[2], Ms. Afruja Ahmed[3], Ms. Afsana Afruz[4], Ms. Afsana Khatun[5], Ms. Amina Khatun[6], Ms. Armina Yesmin[7], Ms. Asmina Parbin[8], Ms. Easmina Aktar[9], Ms. Elima Sikdar[10], Ms. Farhena Parbin[11], Ms. Firuja Aktar[12]

[1]Nursing Tutor, Mental health & Psychiatric Nursing, Rahman Institute of Nursing
[2]Assistant Professor, Mental health & Psychiatric Nursing, Rahman Institute of Nursing
[3,4,5,6,7,8,9,10,11,12]Nursing, Rahman Institute of Nursing

ABSTRACT

Background: According to National Institutes of health, sleep hygiene is defined as "A set of behavioral and environmental recommendations intended to promote healthy sleep.[3]

Objectives: To assess the effectiveness of educational program on the level of knowledge and attitude regarding sleep hygiene of students among the high school students in selected high school, Guwahati, Assam.

Materials and methods: The study adopted a Pre-experimental one group pre-test post-test one group research design, 110 High school students of Down Town Public School, Guwahati, Kamrup (M), Assam, and Bagharbari High School Guwahati, Kamrup (M), Assam, were recruited as sample of the study using Non-Probability Convenient Sampling technique. Socio-demographic Performa, Self-administered structured knowledge questionnaire and 5 Point Likert Scale to assess the attitude regarding sleep hygiene of student, were administered, followed by Educational program using lecture cum discussion for the duration of 45 minutes. The post-test was carried out after seven days from the day of Educational program intervention.

Result: The results revealed that, out of 110 High School Student 64 (58.2) of the High School Student belong to the age group 14-15 years, 55 (50%) of the High School Student were Male, and 55 (50%) of the High School Student were Female, 65 (59.1%) of the High School Student belong to Islam , 48(41.8%) of the Father of High School Children were Daily wager , 59 (53.6%) of the Mother of High School Student were Unemployed, 110 (100%) high school students do not have any medically diagnosed of sleep disorder, 84(76.4%) high school students do not have any habits of drinking coffee in the evening or before bedtime , 97 (88.2%) high school students do not have any habits of drinking caffeinated drinks in the evening or before bedtime, 91(82.7%) high school students do have electronic

device and among them 64(70.4%)student use Smartphone for 1-2 hours and from them maximum 42(46.2%) use Smartphone for educational purpose , 37(33.3%) student use Television for 1-2 hours and 26(23.6%) students use Laptop for 1-2 hours, 64(58.1%) high school student used to sleep for 6-8 hours at night, 86(78.2%) high school student belong to nuclear family and 46(41.8%) high school student have total 2 children in their family. Among 110 High School Student, in pretest majority 59(53.6%) had inadequate knowledge, 41(37.3%) had moderate knowledge and 10(9.1%) had adequate knowledge and 63(57.3%) had negative attitude and 47(42.7%) had positive attitude regarding Sleep hygiene. In post test 76(69.1%) had adequate knowledge and 34(30.9%) had moderate knowledge and 110(100%) of high school students had positive attitude regarding Sleep hygiene. Results regarding knowledge showed that mean post-test knowledge score was 13.10±2.50 higher than mean pre-test knowledge score 7.40±3.09 with mean difference of 5.69 and obtained (t value=15.40, df=109, p=0.001) was found statistically highly significant at $p<0.05$ level and results regarding attitude showed that mean post-test attitude score was 6.20±3.13 higher than mean pre-test attitude score 1.59±2.39 with mean difference of 4.60 and obtained (t value=15.28, df=109, p=0.001) was found statistically highly significant at $p<0.05$ level. Findings indicate that educational program was effective in improving the level of knowledge and attitude towards Sleep hygiene among high school students. There is no any significant association at $p<0.05$ level with pre-test knowledge and attitude regarding Sleep hygiene among high school students with selected socio demographic variables. Result revealed that (r=0.081, p=0.402) indicate weak positive correlation between pretest scores of knowledge and attitude on Sleep hygiene among high school students and was found to be statistically non significant.

INTRODUCTION

"**Sleep is the single most effective thing we can do to reset our brain and body each day".**

- MATHEW WALKER

1.1 : BACKGROUND OF THE STUDY:

Sleep is a natural biological process that provides rest to the body and mind. It is essential for physical growth, natural health, learning, memory and emotional balance. Adequate sleep helps in restoring energy, repairing tissues and strengthening the immune system.[1]

The modern English word "Sleep" came from old English word "Slaèpan" which means "to be or fall asleep".[2]

According to National Institutes of health, sleep hygiene is defined as "A set of behavioral and environmental recommendations intended to promote healthy sleep.[3]

An article published in The Indian Express on June 6, 2025." updated that , a study " 1 in 5 adolescents in Delhi are clinically sleep deprived" conducted by Dr. Bhalla in collaboration with the National Health Systems Resource Centre (NHSRC) found that 22.5% (about 1 in 5) of adolescents aged 12–18 in Delhi were clinically sleep deprived." Poorer sleep hygiene was strongly associated with this sleep deprivation and linked to depressive symptoms and lower academic scores.[4]

U.S National Adolescent Survey (Frontiers in Public Health, 2024)

A national analysis from the Adolescent Behaviors and Experiences Survey found only 23.5% of high school students reported sufficient sleep on an average school night – meaning approximately 76.5% were sleep deprived / had insufficient sleep.[5]

Global Adolescents Review (Sleep Quality Review, 2024)

A comprehensive review of adolescent sleep literature reported that about 70% of high school students

worldwide experience insufficient sleep, largely due to factors such as screen time, stress, and irregular sleep schedules.

Poor sleep practices are unhealthy behaviors that disturb normal sleep, such as irregular sleep timings, excessive use of mobile phones before bedtime, caffeine intake at night, and sleeping in a noisy or uncomfortable environment. These habits affect sleep quality and make it difficult to fall asleep.

1.2 : NEED OF THE STUDY:

A comprehensive review of adolescent sleep research found that about 70% ,of high school students worldwide report insufficient sleep (i.e., less than the recommended amount of sleep).[6]

National survey data in several countries show similar high rates of insufficient sleep on school nights, indicating this is a widely shared global issue—not limited in one region, which affects the adolescents across both developed and developing countries.[7]

According to a worldwide systematic review and meta-analysis conducted among adolescents aged 10–19 years, the prevalence of poor sleep quality and sleep-related problems among adolescents was found to be high globally, with many adolescents experiencing inadequate sleep and disturbed sleep patterns. [36]

A school-based survey conducted among Indian adolescents reported that sleep-related problems and inadequate sleep were common among high school students. The study found that many adolescents slept for less than the recommended duration and experienced daytime sleepiness, irregular sleep habits, and poor sleep quality.[37]

Specific large-scale published data regarding sleep disorder prevalence among adolescents in Assam are limited. However, studies and community reports from Northeast India indicate that stress, excessive screen time, academic pressure, and irregular sleep habits contribute to increasing sleep-related problems among adolescents.[38]

High school students, usually in the age group of 14–17 years, are particularly vulnerable to poor sleep due to academic pressure, screen exposure and lifestyle changes, which results in reduced academic performance, poor concentration, behavioral issues, and also contributes to physical problems (fatigue, low immunity) and psychological problems(stress, anxiety, irritability)among the high school students.

The study will help high school students to improve their knowledge and develop a positive attitude towards sleep hygiene, which will enable them in adopting healthy sleep practices. It will help the high school students by improving their sleep quality, leading to better physical health, mental well-being, concentration and academic performance.

The study will also benefit the researchers by enhancing research skills, increasing understanding of sleep hygiene, and contributing useful data for future research and health education activities.

1.3 : PROBLEM STATEMENT:

A study to assess the effectiveness of educational program on the level of knowledge and attitude regarding sleep hygiene of students among the high school students in selected high school, Guwahati, Assam.

1.4 : OBJECTIVES:

- To assess the pre-test level of knowledge regarding sleep hygiene of students among the high school students in selected high school, Guwahati , Assam.
- To assess the pre-test attitude regarding sleep hygiene of students among the high school students in selected high school, Guwahati , Assam .
- To assess the post test level of knowledge regarding sleep hygiene of students among the high school students in selected high school, Guwahati, Assam.
- To assess the post-test attitude regarding sleep hygiene of students among the high school students in

selected high school, Guwahati , Assam .

- To evaluate the effectiveness of educational program by comparing the pre test and post test scores of knowledge and attitude regarding sleep hygiene of students among the high school students in selected high school, Guwahati, Assam.
- To find out correlation between pre-test scores of knowledge and attitude regarding sleep hygiene of students among the high school students in selected high school, Guwahati, Assam.
- To find out the association between pre-test scores of knowledge and attitude with selected socio-demographic variables.

1.5 : ASSUMPTIONS:

- The high school students may have some knowledge regarding sleep hygiene.
- The high school students may adopt healthy sleep hygiene practices for them if they are provided with adequate knowledge and awareness.

1.6 : OPERATIONAL DEFINITIONS OF TERMS:

Assess:

In this research study, assess refers to determining the knowledge and attitude before and after conducting the educational program.

Effectiveness:

In this research study, effectiveness refers to the result of the educational program in regard to knowledge and attitude regarding sleep hygiene of students among the high school students.

Educational Program:

In this research study, educational program refers to a structured, purposeful set of learning activities and experiences designed to enhance knowledge and attitude regarding sleep hygiene of students among the high school students.

Knowledge

In this research study, knowledge refers to the understanding and responses of the high school students regarding sleep hygiene of high school students.

Attitude

In this research study, attitude refers to the feelings, opinions and judgment of high school students towards sleep hygiene which influence their sleep practices and routines.

Sleep Hygiene

In this research study, sleep hygiene is defined as a set of behavioral and environmental recommendations intended to promote healthy sleep.

Student

In this research study, students are the persons who are studying in class VIII, IX and X in selected high school, Guwahati, Assam.

High School

In this research study, high school refers to institution providing education to class VIII ,IX and X students .

1.7 : HYPOTHESIS:

H1: There will be a significant difference between pre-test and post-test knowledge scores regarding sleep hygiene of students among the high school students in selected high school, Guwahati, Assam at 0.05 level of significance.

H2: There will be a significant difference between pre-test and post-test attitude scores regarding sleep

hygiene of students among the high school students in selected high school , Guwahati, Assam at 0.05 level of significance.

H3: There will be a significant correlation between pre-test scores of knowledge and attitude regarding sleep hygiene of students among the high school students in selected high school Guwahati, Assam at 0.05 level of significance.

H4: There will be a significant association between pre-test knowledge score with selected socio demographic variables at 0.05 level of significance.

H5: There will be a significant association between pre-test attitude scores with selected socio demographic variables at 0.05 level of significance.

1.8 : DELIMITATIONS:

- The present study is delimited to two selected high school, Guwahati, Assam.

1.9 : CONCEPTUAL FRAMEWORK:

Conceptual framework presents logically constructed concepts to provide general explanation of the relationship among the concepts of the research study.[9]

Conceptual framework is a group of concepts that are broadly defined and systematically organized to provide a focus, a rationale and a tool for the integration and interpretation of information. (Mosby's medical dictionary,2018) [10]

The conceptual framework for this study was derived from this general system model given by Von Ludwig Bertalanffy (1968).

According to general system theory, a system is a set of components or units interacting with each other within a boundary and the flow of input and output to and from the system.

The investigator applied the general system theory and aims to assess the effectiveness of educational programs on the level of knowledge & attitude regarding sleep hygiene. This involves interaction between the investigator and high school students.

The major aspects of the system are as follows:

- Input
- Throughput
- Output
- Feedback

- **Input**

Input refers to the matter, energy and information material by human being that enters into the system through its boundaries.

In the present study the input refers to:

- The demographic variables such as Age, Gender, Religion , Occupation of father, Occupation of mother, Habits of drinking coffee, Habits of drinking caffeinated drinks, Use of electronic device, Medically known sleep disorder of student, Type of family, Sleep duration at night, Number of children in the family.
- Assessing pre-test level of knowledge and attitude regarding sleep hygiene using a self-administered structured knowledge questionnaire and 5 point Likert scale.

Throughput

Throughput refers to the information and it enables the input to be transferred in such a way that can be used by the system.

In the present study throughput refers to the administration of the educational program on Sleep hygiene

of students among the high school students .

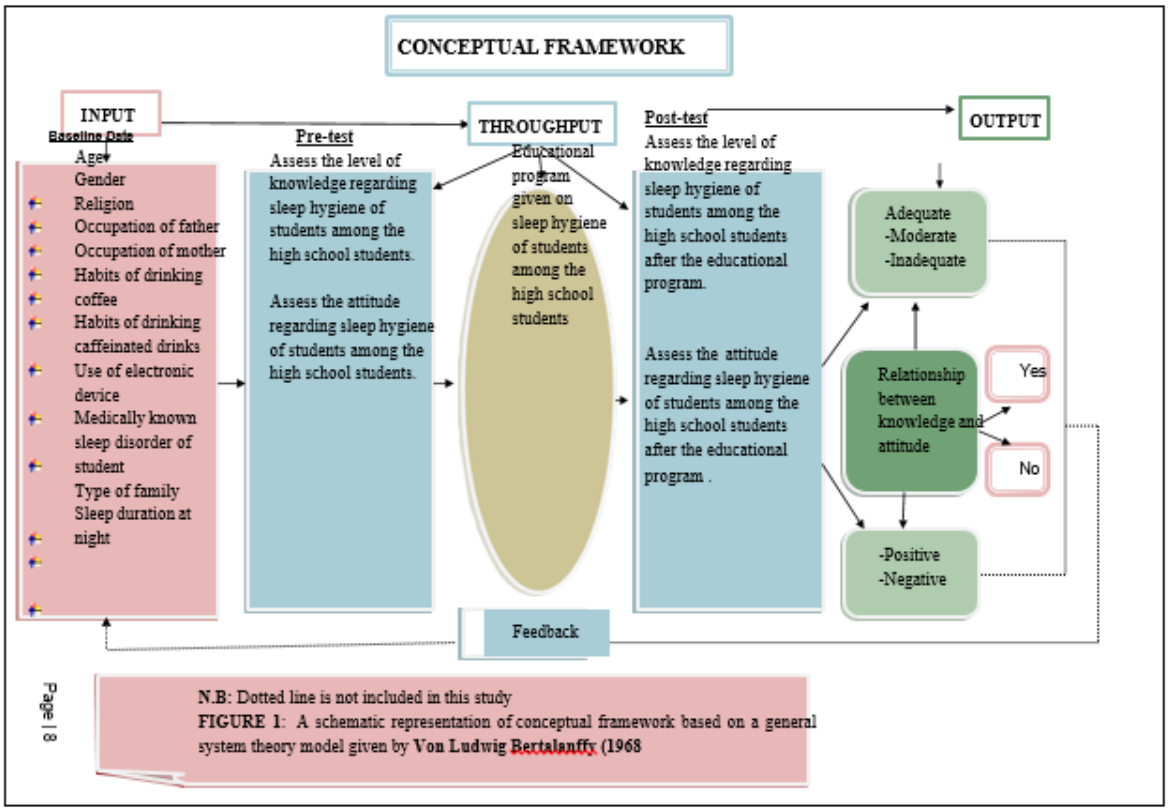
Output

Output is the product, materials or information that is released from the system to the environment.

In the present study, the output refers to the level of knowledge and attitude which was assessed after the administration of the educational program by using self-administered structured questionnaire and 5 point Likert scale.

Feedback

Feedback is the process of communicating what is found in the system. Feedback can be measured by the output. In the present study, feedback is not included.



Page | 8

REVIEW OF LITERATURE

The reviews of literature for the present study are given below:

Section-A: Literature Review related to knowledge and attitude regarding sleep hygiene.

1. **Pradeep Abothu (2025)** conducted a study to assess the knowledge regarding sleep hygiene among first year B.sc Nursing students at a selected nursing college in Eluru, Andhra Pradesh. The aim includes evaluating students existing knowledge, identifying any association between knowledge and demographic variables and developing an informative pamphlet to improve awareness. The study was conducted among 60 first year B.sc Nursing students selected through purposive sampling. A structured questionnaire with demographic details and knowledge based questions on sleep hygiene was used as the data collection tool. Descriptive statistics (mean, percentage, standard deviation) and inferential statistics (Chi-square test) were used to analyze the data. The findings revealed that 87% had moderately adequate knowledge regarding sleep hygiene. The mean knowledge score was 5.17 with a standard deviation 0f 1.35. In conclusions considering the importance of sleep in maintaining physical and mental health, especially in

high pressure academic environments like nursing, there is a pressing need to educate student on proper sleep hygiene. The study recommends integrating sleep hygiene education into the nursing curriculum to support student well being and academic performance.[11]

2. **Wei Zhong, Jie Ding, Xiaoyi Cai, Jun Yan, Fengshu Zhu(2025)** conducted a study on Knowledge, attitude, and practice towards sleep disorders among high school students.This study aimed to explore the Knowledge, Attitude, and Practice (KAP) of Chinese high school students regarding sleep disorders, in order to provide insights for targeted educational interventions. The study was conducted at six schools between November 10, 2023, and December 20, 2023. Demographic characteristics, the Self-Rating Scale of Sleep (SRSS), and the KAP scores of the participants were collected using a self-administered questionnaire. In results a total of 800 valid questionnaires were collected. The mean scores for the SRSS were 23.51 ± 6.18 (possible range: 10-50), for knowledge were 10.00 ± 4.84 (possible range: 0-18), for attitude were 35.53 ± 4.23 (possible range:9-45), and for practice were 28.85 ± 6.29 (possible range:8-40), respectively. The structural equation modeling (SEM) model demonstrated that sleep quality directly influenced knowledge (beta = - 0.154 , $p < 0.001$) , attitude (beta = - 0.169 $p < 0.001$) , and practice ($\beta = -0.356$, $p < 0.001$) . Knowledge also had a direct effect on attitude (beta = 0.216 , $p < 0.001$) and practice (beta = 0.394 , $p < 0.001$) , and attitude directly affected practice (beta = 0.141 $p = 0.042$).In conclusions the study highlights significant knowledge gaps about sleep disorders among Chinese high school students, which could hinder their ability to manage these issues effectively. By focusing on this unique population under substantial academic pressure, the findings underscore the urgent need for tailored educational programs to promote better sleep habits and overall well-being. Educational interventions that enhance knowledge about sleep disorders should be implemented in high school curricula to bridge these gaps and improve sleep-related outcomes. [12]

3. **Weixin Sun, Renyou Pan, Xiaolong Song, Tingting Gu, Qimeng Ni, Yuexing Gu (2024)** conducted a study on Knowledge, attitude, and practice toward sleep hygiene and cardiovascular health at Yancheng TCM Hospital in China, Jiangsu. This study aimed to investigate the knowledge, attitude and practice (KAP) of healthcare workers concerning sleep hygiene and cardiovascular health. A cross-sectional survey was conducted at Yancheng TCM Hospital Affiliated with Nanjing University of Chinese Medicine between July, 2023 and September, 2023. Demographic characteristics, KAP scores, sleep health awareness and habits, and sleep quality were assessed through the questionnaires. The results revealed that a total of 423 valid questionnaires were included in the study. Among these, 215 (50.83%) were aged 35 or below, and 128 (30.26%) reported suffering from chronic insomnia. The mean knowledge, attitude, and practice scores were 43.23 ± 5.67 (possible range: 10-50), 24.53 ± 4.59 (possible range: 9-45), and 20.22 ± 4.46 (possible range: 6-30), respectively. Multivariate analyses indicated that attitude score (OR = 0.890, 95% CI: [0.807-0.981], $p = 0.019$) sleep health awareness & habits score (OR = 1.847 , 95% CI: [1.284-2.656], $p = 0.001$) , experienced chest tightness or heart palpitations (OR = 6.084 , 95% CI: [2.172-17.042], $p = 0.001$) and the presence of chronic insomnia (OR = 5.017, 95% CI:[2.428-10.368], $p < 0.001$) were independently associated with sleep quality. In conclusion healthcare workers had adequate knowledge, negative attitude and moderate practice toward sleep hygiene and cardiovascular health. The findings highlight the need for targeted interventions to address the observed gaps in attitudes and practices, aiming to enhance overall awareness and promote healthier sleep habits among healthcare professionals.[13]

2.

4. **Isadora Grade, Andrea M.Esteves, Fábio S. Lira, Camila S. Padilha, Eduardo Stieler, Valdênio**

Brandt, Samuel Silva, Thiago Lourenço, Marco T. de Mello , and Andressa Silva (2024) conducted a study on Knowledge About Sleep, Sleep Hygiene, and Sleep Behaviors of Paralympic Athletes in Tokyo, Japan. This study aimed to describe and compare the knowledge about sleep hygiene and sleep behaviors practiced by medalists and non medalists Paralympic athletes at the Tokyo 2020 Paralympic Games and between sexes (female vs male), identify whether the coaching staff encourages sleep hygiene and the perspective of these athletes on the importance of sleep hygiene. In methodology 98 Paralympic athletes responded to the Sleep Beliefs Scale and the Athlete Sleep Behavior Questionnaire-BR. The results revealed that medalists (68%) and non medalists (78%) Paralympic athletes had low knowledge about sleep hygiene (60% vs 55%; P = .20), with no difference between groups. The Athlete Sleep Behavior Questionnaire-BR score (48.7 [5.9]) for all Paralympic athletes (n = 98) indicated high practice of maladaptive sleep behaviors. Male athletes had significantly worse sleep behaviors than female athletes (49.1 [6.0] vs. 39.5 [7.2]; P < .01) and less knowledge about behaviors that can affect sleep (64% vs. 72%; P
< .05), 26% of Paralympic athletes considered sleep hygiene practices necessary, and the
frequency of coaching staff encouraging sleep hygiene was higher among medalists Paralympic athletes compared to non medalists athletes (29% vs. 13%, P = .04). In conclusions most Paralympic athletes have inadequate sleep behaviors and knowledge about sleep hygiene. There was no difference between knowledge about sleep hygiene and sleep behaviors between medalists and non medalists Paralympic athletes, although medalists athletes were more encouraged practicing sleep hygiene. Male Paralympic athletes had worse sleep behaviors and worse knowledge about sleep hygiene than female athletes. [14]

5. Ilija Andrijević, Svetlana Simić, Čedomirka Stanojević, Boris Golubović, Dragana Milutinović(2018) conducted a study on Sleep quality in relation to sleep hygiene knowledge and practice, chronotype and lifestyle behavior among healthcare students in Serbia the capital of Belgrade. The aim of this study was to evaluate sleep quality among healthcare science students and to assess its association with sleep hygiene knowledge and practices, circadian typology and lifestyle factors. The research was conducted as a cross-sectional questionnaire-based internet study on a sample of 268 students. The Pittsburgh Sleep Quality Index and the Self-Morningness - Eveningness Questionnaire were applied as research instruments to assess sleep quality and chronotypes respectively, while evaluation of the other variables was conducted using he Sleep Hygiene Knowledge Questionnaire, socio-demographic questionnaire and the questionnaire of lifestyle factors.the findings revealed that the average of the Pittsburgh Sleep Quality Index global score for all students was 6.9 ± 3.2. The poor sleep quality (The Pittsburgh Sleep Quality Index > 5) was reported in 62.7% of students. Sleep efficiency less than 85% was found in 43.0% of students, and 78% of students reported daytime dysfunctionality. Sleep quality was significantly worse among female students; coffee, alcohol and energy drink consumers and long-term cell phone users. Only 11.9% of students were classified as the morning chronotype and they had the best quality of sleep and the best sleep hygiene knowledge and practices, whereas the evening chronotype had the worst quality of sleep. A significant negative correlation was identified between sleep hygiene knowledge (r = -0.133) and practice (r = 0.501) and sleep quality whereby the lower t he Sleep Hygiene Knowledge Questionnaire and Sleep Hygiene Practice Scale scores follow a higher the Pittsburgh Sleep Quality Index score. In conclusion majority of students had a suboptimal level of overall sleep quality, satisfactory knowledge of sleep hygiene, but they did not have the sleep hygiene practices which suggests that knowledge is not a factor of deterring from unhealthy behaviors.[15]

6. Jacksaint Saintila , David Javier-Aliaga , Norma del Carmen Gálvez-Díaz , Luz Antonia

Barreto-Espinoza , Noemi A Buenaño-Cervera , Yaquelin E Calizaya Milla (2025) conducted a study on Association of sleep hygiene knowledge and physical activity with sleep quality in nursing and medical students.This study aimed to evaluate the relationship between knowledge of sleep hygiene and physical activity in relation to sleep quality among nursing and medical students. Methods :In a cross-sectional online study, a suitable and convenient sample of 300 nursing and medical students from a private university located in Chiclayo, Peru, was selected. Data were collected using the following instruments: a questionnaire concerning sleep hygiene knowledge, the International Physical Activity Questionnaire (IPAQ), and the Pittsburgh Sleep Quality Index (PSQI). The data collection period spanned January and February 2024. Results showed that the total sample, 59.3%, 51.7%, and 69.7% reported insufficient knowledge of sleep hygiene, low physical activity and poor sleep quality, respectively. Sleep hygiene knowledge and physical activity explained 17.9% of the variability in sleep quality ($R2 = 0.179$, $F = 32.31$, $p < 0.001$). In addition, there is a positive and significant association between knowledge of sleep hygiene ($\beta = 0.27$; $p < 0.001$) and physical activity ($\beta = 0.24$; $p<.001$) with sleep quality. In conclusion the findings indicate that interventions designed to improve sleep hygiene knowledge and physical activity may be effective strategies for improving sleep duration among nursing and medical students. [16]

7. **Flavia Cortesi, Flavia Giannotti, Teresa Sebastiani, Oliviero Bruni, Salvatore Ottaviano(2004)** conducted a study on Knowledge of sleep in Italian high school students. The aim of the study to evaluate knowledge about sleep and the effect of a sleep educational program on a group of Italian adolescents. the School Sleep Habits Survey was completed by 540 students, aged 17 to 19 years, who were attending three secondary public schools. Students were randomly assigned to the control and intervention group. Only the latter participated in the educational program. A pre-test evaluated baseline knowledge about sleep, a post-test measured the gain in knowledge after the course, and a 3-month follow-up test evaluated long-term retention of information. Improvement in knowledge was measured by increase in correct answers and comparisons of means between baseline and follow-up mean scores. Control group completed only baseline and 3-month follow-up tests. Data were analyzed using repeated measures analysis of variance, Cochran Q, and Mc Nemar tests. Results show that unhealthy sleeping habits in 34% of students associated with high level of subjective sleepiness, increased vulnerability to injuries, and poor daytime functioning. Pre-test score showed a value of 4.2, post-test of 8.6 and 3-month follow-up of 6.7. Low baseline knowledge about sleep, an increase in knowledge, with an average of 50% gain in the percentage of correct answers immediately after the course, with a good long-term retention of information were found for the students who received the intervention as compared with control group.this study concludes that sleep educational programs for secondary students are recommended to improve information about sleep. [17]

Section-B: Literature review related to practice regarding sleep hygiene.

Ruchi Singh, Moulisha M Roy, Anzar Ali, Sunil chouhan, Abhishek Goyal, Narendra K Roi (2025) conducted a study on sleep hygiene and its impact on sleep quality and mood in Bhopal, Madhya Pradesh . Aimed at study elucidated sleep hygiene practices of school-going adolescents and explored its association with their sleep quality and mood. Students of 6th to 12th grade were enrolled after requisite permissions, parental consent, and written informed assent from students. Standardized questionnaires were used to evaluate their sleep hygiene practices – Adolescent Sleep Hygiene Scale (ASHS), sleep quality – Pittsburgh Sleep Quality Index (PSQI), daytime sleepiness – Pediatric Daytime Sleepiness Scale (PDSS) and mood (DASS-21 – Depression Anxiety Stress Scale-21).CTRI/2022/06/043556 is the study number in Clinical Trial Registry of India. Results: In results adolescents with mean age 14.28 ± 1.86

years, including 8.7% (479) males and 51.2% (503) females participated in this study. Mean sleep hygiene score was 4.37 ± 0.60, with no difference between males and females. In conclusion a clear relationship between sleep hygiene practices, mood and sleep quality has been observed among adolescents. Young adolescents who followed better sleep hygiene practices had lesser mood derangements and better sleep quality. Though ASHS scores were same among both genders but female had poor sleep quality, higher daytime sleepiness and mood.[18]

Suhasini R Kanyadi, Varsha M Shindhe, Ravikiran P Kamate, Shivalingappa B Javali (2025) conducted a study on Sleep Hygiene Practices and Sleep Quality Among Undergraduate Medical Student in Belagavi, Karnataka. Aimed at study to estimate the magnitude and beliefs about of poor sleep hygiene among medical student and to identify specific changes to needed to Sleep Hygiene Index (SHI). A study involving 293 undergraduate medical students using a pre-designed, self-administered questionnaire was conducted. Validated instruments the SHI and Pittsburgh Sleep Quality Index were used. The results revealed that poor sleep hygiene practices (47.4%) and poor sleep quality (69.3%) were prevalent among sub-stantial number of medical students. Bedtime technology use, sleep latency (AOR-2.276), sleep disturbance (AOR-2.459), use of sleeping medication (AOR-6.559) and daytime dysfunction (AOR-2.128) had a significant association with poor sleep hygiene practices ($p<0.05$). The area under the ROC curve for SHI as a tool for predicting good sleep quality was 0.663.In conclusions regularization of sleep schedules by conducting time-management workshops among students and addition of items in SHI, on bedtime technology use along with dietary changes and daytime exposure to sunlight to improve sleep quality is recommended. [19]

Neha D. Gavale , David N. Isaac , Rita M. Khadikar, Catherine D. Isaac (2024) conducted a study on sleep hygiene practices and quality of sleep in health professional students in Mangaluru, Karnataka. This study aims to assess health professional student's sleep quality and hygiene practices and evaluate the correlation between these two factors. This study involved 320 health professional students who completed a self-administered questionnaire. The Pittsburgh sleep quality index(PSQI) was used to assess sleep quality, while the sleep hygiene index (SHI) was used to evaluate sleep hygiene practices. Data were recorded in Excel and analyzed by a statisticianthe 320 participants, 74.4% (238 students) exhibited a moderate SHI, 13.4% (43 students) had a
fair SHI, 11.6% (37 students) demonstrated excellent sleep hygiene, and 0.6% (2 students) showed poor sleep hygiene. Additionally, 63.8% (204 students) reported poor sleep quality, while 36.3% (116) experienced good sleep quality in conclusion most health professional students followed moderate sleep hygiene practices and reported poor sleep quality. Statistical analysis revealed a significant positive correlation between sleep hygiene and sleep quality, suggesting that improving sleep hygiene practices may lead to better sleep quality.[20]

Eman M Alanazi , Abeer Mohammed M Alanazi , Asmaa Hamed Albuhairy, Alshaymaa Akram A Alanazi (2023) conducted a study on Sleep Hygiene Practices and Its Impact on Mental Health and Functional Performance Among Adults in Tabuk City, Saudi Arabia. The aim of this study was conducted to evaluate sleep hygiene practices and assess the impact of sleep hygiene on sleep quality and the mental health of the adult population of Tabuk city. In methodology a self-administered questionnaire was developed by the researchers to assess sleep hygiene practices and their impact on the sleep quality and mental health of the study participants. In results the study included 384 adults. There was a significant association between the frequency of sleep problems and poor sleep hygiene practices ($p < 0.001$). The percentage of subjects who had problems sleeping during the past three months was significantly higher

among those having poor sleep hygiene practices (76.5%) than their counterparts (56.1%). The rates of excessive or severe daytime sleepiness were significantly higher among individuals with poor hygiene practices (22.5% versus 11.7% and 5.2% versus 1.2%, p = 0.001). Participants with depression were found to be significantly higher among the poor hygiene group (75.8%) in comparison to those having good hygiene practices (59.6%) (p
= 0.001).in conclusions the findings of the present study indicate significant associations between poor sleep hygiene practices and sleep problems, daytime sleepiness, and depression among adult residents of Tabuk city, Saudi Arabia.[21]

Bindu John (2020) conducted a study on Sleep duration and sleep hygiene practices in adolescents age and gender differences in Mangaluru, Karnataka. The study aims at assessing the sleep hygiene practices among Indian adolescents and to identify the age and gender influence on sleep duration and sleep hygiene practices. In methodology the data drawn from a part of pilot study conducted among adolescents from sixth to 12th grade in India as a part of doctoral research. A stratified random sampling method was used .A total of 58 adolescents, 29males and 29 females participated in the study. Data was collected using two questionnaires, one for the general demographic data with a part on sleep duration and the second for estimating the sleep hygiene practices. In results the adolescents slept on an average of 7.68 +_99 h during school days, and 8.70+_1.63h on weekends. Middle adolescents slept less than early adolescents. Gender showed no significance with sleep duration, since p-values were >.05 level of significance. The mean sleep hygiene index scores were 28.59+_6.71. Even though the sleep hygiene scores of males were slightly better than females, It was not statistically significant. In conclusion adolescents in the study obtained less than recommended hours of sleep for their age on school days. Sleep hygiene practices were moderately poor among adolescents. Emphasizing good sleep hygiene practices, and integrating sleep promotion programs into daily routines should be considered to improve the sleep problems in adolescents.[22]

Amy R. Wolfson PhD 1,Elizabeth Harkins BA,Michaela Johnson BA, Christine Marco PhD(2015) conducted a study on sleep hygiene practices, sleep health efficacy, and behavioral well-being. The aim of the study to primarily improve sleep health behaviors and secondarily improve academic performance and behavioral well-being.In methodology participants a diverse group of seventh graders from 2 urban, middle schools were randomly assigned, according to school, to an 8-session Sleep Smart Program (SS = 70) or a comparison group (comparison = 73).Results shows that SS seventh graders experienced significantly greater sleep health efficacy, improved physiological and emotional sleep hygiene, more time in bed, and earlier bedtimes vs comparison group. SS (vs comparison) participants also reported a significant decrease in internalizing behavior problems and sustained academic performance. Finally, although not maintained at time 4, SS participants continued to report improved sleep health efficacy at time 3, whereas the comparison group participants' sleep health efficacy declined.This study concludes that the Sleep Smart preventive intervention was effective in improving sleep health efficacy, sleep hygiene, time in bed, and bedtimes; in maintaining grades; and in reducing internalizing behavior problems, yet these changes were not sustained at follow-up. [23]

Section C: Literature review related to the effectiveness of education program regarding sleep hygiene.

Gaby Illingworth, Rachel Sharman, Christopher James Harvey,Russel C. Foster , Colin A. Espie (2020) conducted on the effectiveness of a school-based sleep education program at improving early adolescent sleep in UK. The aim of the study was to evaluate the impact of a school-based sleep education program on adolescent sleep and sleep knowledge. The study was conducted in students in year 10 (n =

1504; mean age
= 14.14 ± 0.35 years) from UK state (non-fee-paying) secondary schools. Students received the lessons and parents received a leaflet. Effectiveness was assessed using measures across two time points (pre and post intervention). Students completed questionnaires on sleep knowledge, sleep quality, sleep behavior, sleep hygiene, daytime sleepiness and health-related quality of life. A sub-sample provided objective (autography, n=84) and objective (sleep diary, n=74) sleep measures. Results indicated large improvements in sleep knowledge (d=0.78), and smaller improvements in sleep quality (d=0.15) and sleep hygiene (d=0.11) were observed, but not in daytime sleepiness or health-related quality of life. Small and limited changes in subjective and objective sleep patterns were found. Baseline sleep quality was differentially associated with key outcomes, with those initially self-reporting poor sleep demonstrating an improvement in sleep quality, sleep hygiene and sleepinessK.[24]

Ka-Fai Chung, Chit-Tat Lee, Wing-Fai Yeung, Man-Sum Chan, Emily Wing-Yue Chung, Wai-Ling Lin (2018) conducted a study on Sleep hygiene education as a treatment of insomnia and cognitive behavioral therapy for insomnia (CBT-I) in Hong Kong. This study aimed to review the efficacy of sleep hygiene education for poor sleep or insomnia. In methods systematically searched six key electronic databases up until May 2017. Two researchers independently selected relevant publications, extracted data and evaluated methodological quality according to the Cochrane criteria. Major findings include (i) there were significant pre - to post-treatment improvements following sleep hygiene education, with small to medium effect size; (ii) Sleep hygiene education was significantly less efficacious than CBT-I, with difference in effect size ranging from medium to large; (iii) pre- to post-treatment improvement and sleep hygiene education -CBT-I difference averaged at 5% and 8% in sleep-diary-derived sleep efficiency, respectively, and two points in Pittsburgh Sleep Quality Index; (iv) Only subjective measures were significant and (v) no data on acceptability, adherence, understanding and cost-effectiveness. In conclusions although sleep hygiene education is less effective than CBT-I, unanswered methodological and implementation issues prevent a firm conclusion to be made on whether sleep hygiene education has a role in a stepped-care model for insomnia in primary care.[25]

Zohreh Yazdi, Shabnam Jalilolghadr, Farid Tootoonchian (2017)
conducted a study on Effect of a sleep hygiene education program on sleep problems in female nurses on shift work in Iran. The aim of this study was to determine the effect of a sleep hygiene course in nurses suffering from sleep disorders. This study was conducted among nurses with clinical insomnia. The nurses were randomly divided into intervention (50 nurses) and control (50 nurses) groups. For nurses in the intervention group, a 2-hour training session was held about sleep hygiene practices. 1 month after the intervention, the Persian versions of Insomnia Severity Index (ISI), Epworth sleepiness scale (ESS), and Pittsburg sleep quality index (PSQI) questionnaire were completed by all participants. Data were analyzed using t test. All nurses were female, and their mean age was 29.8±3.2 years. After the intervention, sleep latency was 15.5±8.8 and 35.7±19.7 minute in the intervention and control groups, respectively (P< 0.001). Total sleep duration per day was 462.6±21.4 and 436.8±18.8 minute in the intervention and control groups, respectively (P< 0.001). Total PSQI score (5.4±0.9 vs. 7.0±1.2, P= 0.003), ISI (9.3±1.2 vs. 15.3±2.7, P< 0.001), and ESS (7.6±1.3 vs. 10.6±1.6, P< 0.001) in the intervention group were significantly lower than control group. In conclusion Sleep hygiene education consisted of a 2-hour session, and an educational brochure improved sleep problems in shift work nurses.[26]

Shellene K Dietrich et al (2016) conducted a study on effectiveness of sleep education programs to improve sleep hygiene and/or sleep quality in college students in United States. This study aimed to

identify, appraise and synthesize the best available evidence on the effectiveness of sleep education programs in improving sleep hygiene knowledge, sleep hygiene behavior and/or sleep quality versus traditional strategies. A quantitative papers were assessed by two reviewers using critical appraisal instruments from the Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instrument (JBI-MASTARI).The results revealed a total of 423 valid questionnaires were included in the study. Among these, 215 (50.83%) were aged 35 or below, and 128 (30.26%) reported suffering from chronic insomnia. The mean knowledge, attitude, and practice scores were 43.23 ± 5.67 (possible range: 10-50), 24.53 ± 4.59 (possible range: 9-45), and 20.22 ± 4.46 (possible range: 6-30), respectively. Multivariate analyses indicated that attitude score (OR = 0.890, 95% CI: [0.807-0.981], p = 0.019) sleep health awareness & habits score (OR = 1.847 , 95% CI: [1.284-2.656], p = 0.001) , experienced chest tightness or heart palpitations (OR = 6.084 , 95% CI: [2.172-17.042], p = 0.001) and the presence of chronic insomnia (OR = 5.017, 95% CI: [2.428-10.368], p < 0.001) were independently associated with sleep quality.

In conclusion healthcare workers had adequate knowledge, negative attitude and moderate practice toward sleep hygiene and cardiovascular health. The findings highlight the need for targeted interventions to address the observed gaps in attitudes and practices, aiming to enhance overall awareness and promote healthier sleep habits among healthcare professionals.[27]

Deora Johnson, PHMNP Anthony Roberson PhD (2013) conducted a study on the evaluation of the effectiveness of relaxation training and sleep hygiene education for insomnia of depressed patients in United States. This scholarly project involved the implementation and evaluation of a relaxation training and sleep hygiene education intervention for female patients who experience major depressive disorder and insomnia. In methodology Participants attended 4 consecutive, weekly outpatient sessions lasting approximately 1 hr. The initial session consisted of conducting a psychiatric evaluation and administration of the Pittsburgh Sleep Quality Index to measure rating of sleep quantity and quality. Principles of sleep hygiene and relaxation exercises were introduced during the initial session. Subsequent sessions focused on reinforcement of the principles of sleep hygiene and relaxation training. The results revealed sleep hygiene education and relaxation training were effective in treating insomnia of depressed patients. [28]

Ms. Arti Choudhary, Ms. Haritha M. Nair, Mr. Jaivin Jaisingh J, Mr. Libin Joseph conducted a study on effectiveness of sleep hygiene programme on knowledge and practice regarding sleep hygiene among selected institutionalized older adults. The main aim of the investigation was to evaluate the impact of sleep hygiene programme on knowledge and practices regarding sleep hygiene among selected institutionalized older adults. The participants in this investigation comprises were 100 older adults of Vedic Vradha Ashram Budhivihar Moradabad U.P. The sample was chosen using a purposive sampling strategy. Demographic variables assessment, Self-structured tool to assess practice & Standardized tool Pittsburgh sleep quality index were the tools used to collect the data. In RESULT- A) - Assessment of knowledge and practices regarding sleep hygiene among selected institutionalized older adults. Regarding pre-test knowledge level most of the older adults (94%) were having poor knowledge 6(6%) were having average knowledge level. In the post-test, 5(5%) had average knowledge and 95(95%) had a good level of knowledge and the pre-test level of practice, 97(97%) had poor sleep quality 3% were having Good sleep quality. In the post-test 49(49%) had poor sleep quality and 51 (51%) had Good sleep quality. B) Impact of sleep hygiene programs on knowledge and practices regarding sleep hygiene among selected institutionalized older adults. Mean pre-test level of practice (16.25) lesser than mean post-test level of practice score (4.36); hence it is showed the effectiveness of the demonstration.C) - Association between

pre-test knowledge level and practices of sleep hygiene among selected institutionalized older adults. Data shows that last Profession and Marital status are significant and all other demographic variables are non-significant in the revealed statistical association with pre-test level of knowledge scores shows that duration of staying home is significant and all other demographic variables are non-significant in the revealed statistical association with pre-test level of knowledge score.

This investigation concluded that demonstration was an effective way to teach sleep hygiene among older adults. It enhances the knowledge and practice regarding sleep hygiene that will reduce sleep deprivation and improves health and lifestyle outcomes. [29]

Mohammad Isaque Manik, R Sreevani conducted a study on Effectiveness of structured teaching programme regarding sleep hygiene and sleep disorders on knowledge of students in a selected pre-university college at Bengaluru.The aim of the study was to evaluate the effectiveness of structured teaching programme regarding sleep hygiene and sleep disorders on knowledge of pre-university students in a selected college at Bengaluru. In methodology a pre-experimental research was conducted with 60 pre-university students; samples were selected using simple random sampling technique, and the data was collected using structured socio-demographic proforma and knowledge questionnaire on sleep hygiene and sleep disorders. Structured teaching programme on sleep hygiene and sleep disorders was given on the same day. Post test was conducted after seven days. In results there was a statistically significant difference in pre- and post-test knowledge scores ($t=26.71$, $p<0.001$) of pre-university students with respect to sleep hygiene and sleep disorders. Association between socio-demographic variables and pre-test knowledge scores showed that there was significant association between religion and pre-test knowledge scores. Findings conclude that structured teaching programme regarding sleep hygiene and sleep disorders was effective in increasing knowledge score among pre-university students. [30]

CHAPTER- III
RESEARCH METHODOLOGY

Research methodology is a way to systematically solve the Research problem. It may be understood as a science of studying how research is done scientifically. In this, we study the various steps that are generally adopted by a researcher in studying his research problem along with the logic behind them. [31]

It is necessary for the Researcher to know not only the research methods/techniques but also the methodology. Researchers not only need to know how to develop certain indices or tests, how to Calculate the mean, the mode, the median or the standard deviation or Chi-square, how to apply particular research techniques, but they also need to know which of these methods or techniques, are relevant and which are not, and what would they mean and indicate and why.

Researchers also need to understand the assumptions underlying various techniques and they need to know the criteria by which they can decide that certain techniques and procedures will be applicable to certain problems and others will not. All this means that is necessary for the researcher to design his methodology for his problem as the same may differ from problem to problem. [32]

This chapter deals with the research methodology adopted to assess the Effectiveness of educational program on the level of knowledge and attitude regarding sleep hygiene of students among the high school students in selected high school, Guwahati, Assam. This chapter includes research approach, research design, variable, setting up of the study, population, sample and sampling technique, pilot study, plan for pilot study and data analysis.

3.1 : RESEARCH APPROACH:

A research approach is the overall strategy or plan that guides the research process, providing a framework for the collection, analysis, and interpretation of data. The research approach is often categorized as quantitative, qualitative or mixed methods, depending on the nature of the data and the objectives of the study. [32]

It involves the description of the plan to investigate the phenomenon under study in a structured (quantitative), unstructured (qualitative) or a combination of two methods (quantitative-qualitative integrated approach). The approach helps to decide about the presence or absence as well as manipulation and control over variables. It also helps to identify the presence or absence of and comparison between groups. [33]

In present study, a quantitative research approach was used to accomplish the objectives for determining the Effectiveness of educational program on the level of knowledge and attitude regarding sleep hygiene of students among the high school students in selected high school, Guwahati, Assam.

3.2 : RESEARCH DESIGN:

The research design is the master plan specifying the methods and procedures for collecting and analyzing the needed information in a research study. [33]

The research design used for the present study was pre-experimental research design (one-group pre-test and post-test design), to evaluate the effectiveness of educational program on the level of knowledge and attitude regarding sleep hygiene of students among the high school students in selected high school, Guwahati, Assam.

3.3 : VARIABLES:

Variables are the attributes or characteristics that can have more than one value. In other words, variables are the qualities, properties or characteristics of person, things or situation that can change or vary.

Chinn and Kramer stated that "Variables are concepts at different level of abstractions that are concisely defined to promote the measurement or manipulation within study. [33]

The present study consists of independent, dependent and Socio-demographic variables:

- Independent variables: An independent variable is the factor in a study that researchers actively change or control to see if it causes any effect or change.

In present study, the independent variables is the educational program regarding sleep Hygiene among the high school students.

- Dependent variables: A dependent variable is the outcome of effect in a study that changes in response to the independent variable.

In the present study, the dependent variables is the post-test knowledge and attitude regarding sleep Hygiene among the high school students.

- Socio-demographic variables: Refers to the specific traits on features of the group of people (Sample) included in a study.

In present study, Socio-demographic variables were Age, Gender, Religion , Occupation of father, Occupation of mother, Habits of drinking coffee, Habits of drinking caffeinated drinks, Use of electronic device, Medically known sleep disorder of student, Type of family, Sleep duration at night, Number of children in the family.

3.4 : SETTING:

The study setting is the location in which the research is conducted partially controlled, of highly controlled, it could be natural, partially controlled or highly controlled. [33]

The present study was conducted at Downtown Public School, Guwahati, Kamrup (M), Assam and Bagharbari High School, Guwahati, Kamrup (M), Assam.

3.5 : POPULATION:

The term "population" refers to a group of individuals, items, or elements that share specific common characteristics that a researcher is interested in studying. This population represents the entire group that is the subject of the research. [32]

In the present study, population includes the High School Students at selected school.

Target Population: This encompasses the entire group of people or objects to which the study findings are intended to be generalized and who meet the researcher's specified eligibility criteria. The eligibility criteria are the criteria defined by the researcher to determine who will or will not be included in the study, [32]

In the present study, the target population includes the high school students in a selected high school, Guwahati, Assam.

Accessible Population: A portion of the population that is practically accessible to the researcher needs to be selected and may be restricted to a region, state, city, country or institution.

In this present study, the accessible population are the students studying in class 8th, 9th and 10th standard in Downtown Public School, Guwahati, Kamrup (M),Assam and Bagharbari High School, Guwahati, Kamrup (M), Assam.

3.6 : SAMPLE AND SAMPLING TECHNIQUE

SAMPLE: Sample is a selected group of individuals taken from a population for a research study.

In this present study, the sample will be the high school students who full fill the inclusion criteria.

SAMPLE SIZE: Sample size is calculated using " Solvin's formula "[32]

$$n = N/(1+Ne^2)$$

where

n = Required sample size

N= Total population size

e= Margin of error

In the present study, N = 216

Therefore,

$$n = \frac{216}{(1+216\times 0.05^2)}$$

$$n = \frac{216}{(1+216\times 0.0025)}$$

$$n = \frac{216}{1+0.54}$$

$$n = \frac{216}{1.54}$$

$$n = 140.25$$

In the present study, the sample size was calculated using Slovin's formula, with a 5% margin of error. The total population was N=216, which gave a required sample size of 140.

Out of the total 140, 20 were used for establishing the reliability of the tool, 10 were used for conducting the pilot study to check feasibility and clarity of the study.

Therefore, 110 were used for the main study.

SAMPLING TECHNIQUE: "Sampling is the procedure of selecting a representative subset of a population with the aim of discerning of characteristics of the entire population." Sampling involves the selection of an unbiased or random sample from the population to gain insights into the target population, " [32]

In this study, the sample will be selected by non-probability convenient sampling technique.

3.7 : CRITERIA FOR SAMPLE SELECTION:

The study samples were selected based on the following inclusion and exclusion criteria:

Inclusion criteria

- Students who are willing to participate in the study.
- Students who are available at the time of data collection.

Exclusion criteria

- Students whose parents are not allowing them to participate.

3.8 : TOOLS:

A research instruments is a device used to measure the concepts of interest in a research project that a researcher used to collect data. [33]

- **DEVELOPMENT OF THE TOOL**

For this study a socio-demographic performa was developed to assess socio-demographic variables, structured knowledge questionnaire to assess the knowledge regarding sleep hygiene, 5 Point Likert scale to assess attitude regarding sleep hygiene of students and a lesson plan for structured educational programme was developed on sleep hygiene.

The following were undertaken to select and develop the tool for data:

- An extensive review of literature
- Discussion with Guide, Co-guide and experts
- Based on researcher's personal knowledge
- Books and journals
- Internet

- **DESCRIPTION OF TOOL**

In the present study, the tool was prepared which consist of the following sections:

Section (A): Socio-demographic Performa.

This section of tool consists of Socio-demographic Performa constructed by the investigator which consisted of 12 variables: Age, Gender, Religion , Occupation of father, Occupation of mother, Habits of drinking coffee, Habits of drinking caffeinated drinks, Use of electronic device, Medically known sleep disorder of student, Type of family, Sleep duration at night, Number of children in the family.

Section (B): Self-administered structured knowledge questionnaire regarding Sleep Hygiene.

This section of tool consisted of structured (multiple choice questions) to assess the knowledge of High

School Students regarding Sleep hygiene. The tool consisted of 18 multiple choice questions. The questions were framed to elicit information pertaining to the sample's knowledge regarding, general information about sleep hygiene, Importance of sleep hygiene, causes of poor sleep hygiene, Effects of poor sleep hygiene, Measures to improve sleep hygiene.

Each item comprised of three distractors with one correct answer. A score of "One" (1) was given for correct response and "Zero" (0) was given for incorrect response. The maximum possible score was 18. The score ranges from minimum of "score 0" and maximum of "score 18"

Based on the scores, the knowledge level was divided into three categories. Below or equal to 6 score were categorized as inadequate knowledge, 7-12 score were categorized as moderate knowledge and 13-18 of the score were categorized as adequate knowledge.

Section (C): 5 Point Likert Scale.

This section of the tool consisted of a structured 5-point Likert scale to assess the attitude of participants regarding the sleep hygiene. The scale included a total of 10 statements, comprising both positive and negative items.

Each item had five response options:

- Strongly agree
- Agree
- Uncertain
- Disagree
- Strongly disagree

For positive statements, the scoring pattern was:

Strongly agree = **+2**, Agree = **+1**, Uncertain **= 0**, Disagree = **-1**, Strongly disagree = -2. For negative statements, the scoring was reversed to reduce response bias:

Strongly agree = **-2**, Agree = **-1**, Uncertain = **0**, Disagree = **+1**, Strongly disagree = **+2.**

Each item carried equal weight. The total attitude score was calculated by summing the scores of all 10 items. The maximum possible score was +**20**, and the minimum possible score was **-20**.

Higher the score, higher the positive attitude of the participants.

Based on the total scores, the attitude level of the participants was interpreted as follows:

+**1** to +**20** – Positive attitude

0 to **-20** – Negative attitude

3.9 : CONTENT VALIDITY:

Validity refers to an instrument ability to actually test what it is supposed to test. [32]

The prepared tool along with the problem statements, objectives of the study, hypothesis demographic Performa to assess demographic variables, structured knowledge questionnaire, 5 point Likert Scale to assess attitude regarding sleep hygiene and lesson plan on sleep hygiene and validation certificates was given to three experts. Among them, two were from the field of Psychiatric Nursing department and one was student counselor. The experts were chosen based on their clinical expertise and interest in the problem area, the experts were requested to give opinion, suggestion and verify the items for relevancy, accuracy and appropriateness

Percentage of agreement for each item was taken. For demographic Performa all the items were retained with necessary modification. For structured knowledge questionnaire and lesson plan some items were removed and necessary modification and simplification of the language were done.

3.10 : LANGUAGE VALIDITY OF THE TOOL:

The tool and lesson plan for the educational program were validated by the Assamese expert for appropriateness. The modification was made on few items as per the suggestion of the expert.

3.11 : RELIABILITY OF THE TOOL:

Reliability is also known as precision, reproducibility, consistency and repeatability. It is the ability of the tool to give similar measurement or reading under the similar condition on the same subject. [28]

Twenty students in Tepuram Teron High School, Guwahati, Kamrup (M), Assam, who were not part of the main study, were used to test the reliability of the instruments.

The reliability of the Self-administered structured knowledge questionnaire for assessment of knowledge regarding Sleep Hygiene of student was checked by Split-half method and reliability of 5-Point Likert Scale for assessment of Attitude regarding Sleep Hygiene was checked by using test-retest method. The Reliability of Self-administered structured knowledge questionnaire is found r=0.83 and the reliability of 5-Point Liker Scale is found r=0.74. Thus the tool prepared is found to be reliable for our research study.

3.12 : ETHICAL CONSIDERATION:

- Permission was obtained from the Principal of Rahman Institute of Nursing and Paramedical Sciences to conduct the study.
- Written permission was obtained from the Principal of Down Town Public High School Guwahati, Assam.
- Written permission was obtained from the Principal of Bagharbari High School Guwahati, Assam.
- Formal approval was obtained from Institutional Ethics committee of Rahman Hospitals Pvt.Ltd. and its Allied Educational Institutions.
- Informed consent was taken individually from the participants' parents through the Principal of selected High School, Guwahati, Assam.

3.13 : PILOT STUDY:

A pilot study refers to as a mini version of a full scale study, as well as the specific pretesting of a particular research instrument such as a questionnaire or interview schedule. It is also known as "feasibility study". [28]

- To assess the feasibility in the main study, the pilot study was conducted among 10 High School student in Tepuram Teron High School, Guwahati, Kamrup (M), Assam.
- Data were collected through pre-test and post test by using Self-administered structured questionnaire and 5 point Likert Scale.
- 10 samples were selected by using Non probability Convenient Sampling Technique.
- High School Student was given a pre-test and Educational Program regarding Sleep hygiene on the first day.
- After some days, post test was conducted to assess their Knowledge and attitude regarding Sleep hygiene.
- Collected data were tabulated, and analyzed by using descriptive and inferential statistics.

The results of the pilot study pre-test indicated that most of the High School student had Inadequate knowledge and negative attitude regarding Sleep hygiene. Whereas, after the Educational Program, in the

post-test majority of High School had adequate knowledge and attitude regarding Sleep hygiene.
The study was found to be feasible, and the pilot study did not reveal any flaws in the research design.

3.14 : DATA COLLECTION PROCEDURE:

Data (singular datum) are the distinct pieces of information that are collected, observed, or created for the purposes of analysis to generate the results of a study and to reach at some conclusion. Data collection is the systematic process by which the researchers gather information from various sources to address the research questions." [32]

- A formal written permission was obtained from the Principal of Down Town Public School, Guwahati-781022 and from the Principal of Bagharbari High School.
- The data was collected from 28 April, 2026 to 04 May, 2026 from 110 High School Student of Down Town Public School and Bagharbari High School.
- The samples were selected by Non Probability Convenient Sampling Technique.
- The purpose of the study was explained to the participants and informed consent was taken from participants' parents through Principal.

On the first day in Down Town Public School pre-test was conducted by using Self-structure knowledge questionnaire and 5 point Likert Scale to assess attitude regarding Sleep Hygiene and on the same day an educational programme was conducted regarding sleep hygiene for the duration of 45 minutes and after one week post test was conducted. Same pattern followed for Bagharbari high school, On the first day in Bagharbari high school pre-test was conducted by using Self-structured knowledge questionnaire and 5 point Likert Scale regarding Sleep Hygiene and on the same day an educational programme was conducted regarding Sleep Hygiene for the duration of 45 minutes and after one week post test was conducted.

3.15 : PROBLEM FACED DURING DATA COLLECTION:

No major problem was faced during the period of data collection,

3.16 : PLAN FOR DATA COLLECTION:

Data analysis is the technique used to reduce, organize and give meaning to data. [33]
The data will be analyzed through descriptive and inferential statistics.

3.17 : SCHEMATIC DIAGRAM

PROBLEM STATEMENT

A study to assess the effectiveness of educational program on the level of knowledge and attitude regarding sleep hygiene of students among the high school students in selected high school, Guwahati, Assam

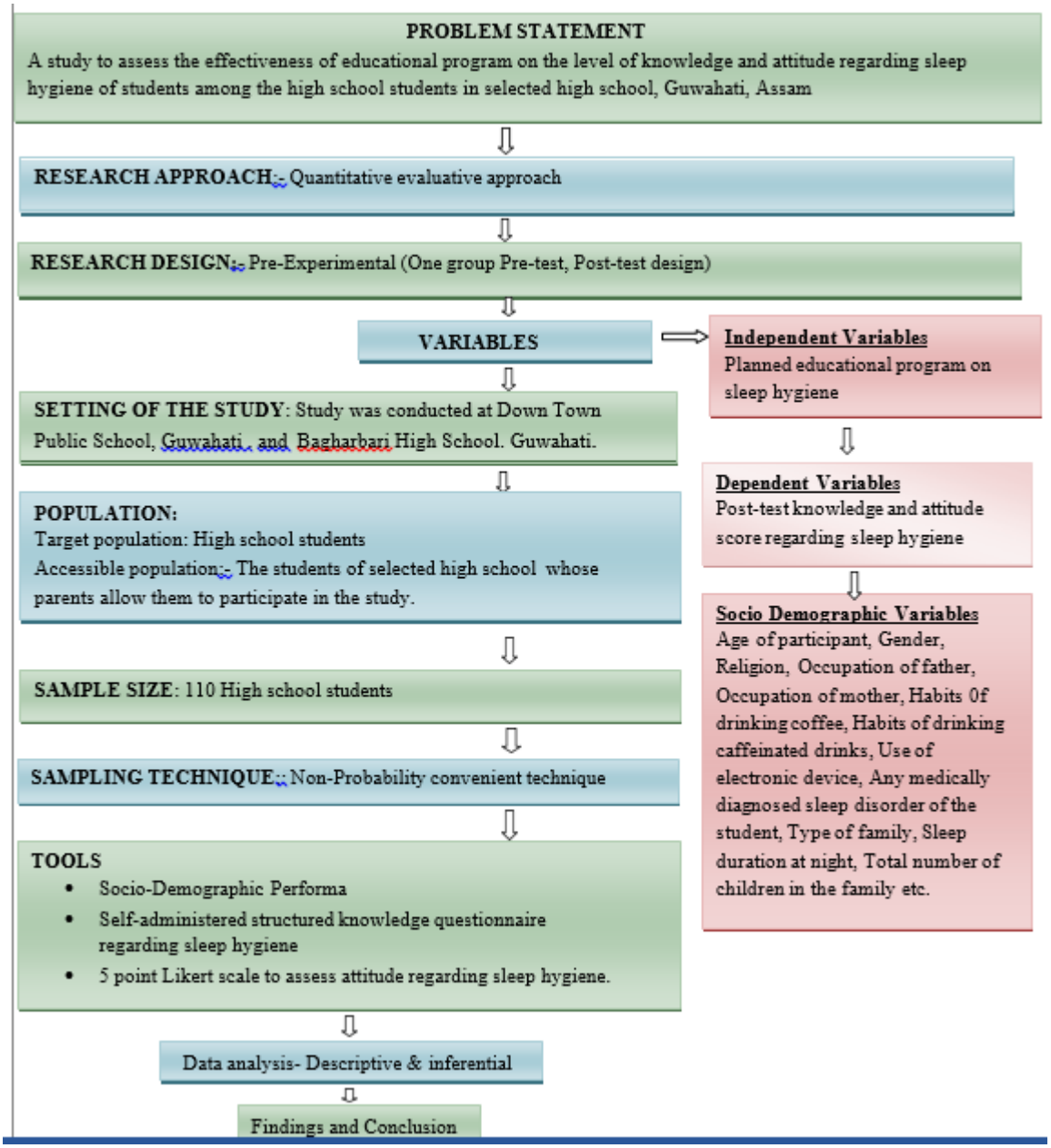


FIGURE 2 : SCHEMATIC REPRESENTATION

CHAPTER-IV
ANALYSIS AND INTERPRETATION
4.1 : DATA INTERPRETATION AS PER SECTION
4.1.1 : SECTION I: DESCRIPTION OF FREQUENCY AND PERCENTAGE DISTRIBUTION OF DATA ACCORDING TO THEIR DEMOGRAPHIC VARIABLES

These section present data regarding frequency and percentage distribution of High School Students according to selected Socio-demographic variables such as Age of participant, Gender, Religion, Occupation of father, Occupation of mother, Habits 0f drinking coffee, Habits of drinking caffeinated drinks, Use of electronic device, Any medically diagnosed sleep disorder of the student, Type of family,

Sleep duration at night, Total number of children in the family. The data are tabulated according to the specific variables in the following tables.

TABLE 1.1

FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO THEIR AGE.

n = 110

AGE	FREQUENCY (f)	PERCENTAGE (%)
12-13 years	11	10
14-15 years	64	58.2
Above 15 years	35	31.8
TOTAL	**110**	**100**

Data percentage in **Table 1.1** shows that out of 110 High School Students, 11 (10%) belongs to age group 12-13 years, majority i.e., 64 (58.2%) belong to age 14-15 years and 35 (31.8%) belong to age group ≥ 15 years.

n = 110

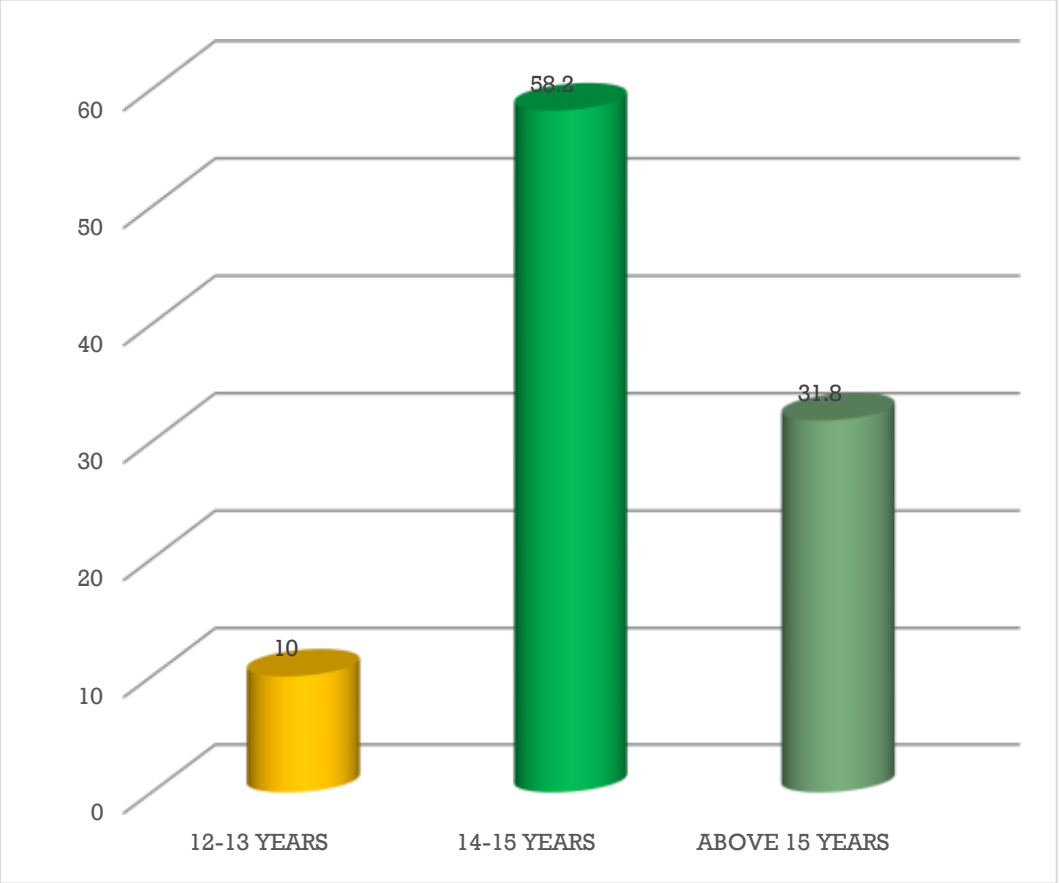


FIGURE-3

COLUMN DIAGRAM REPRESENTING FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH STUDENTS ACCORDING TO THEIR AGE.

TABLE 1.2
FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO GENDER.

n =110

GENDER	FREQUENCY (f)	PERCENTAGE (%)
Male	55	50
Female	55	50
TOTAL	**110**	**100**

Data presented in **Table 1.2** shows that out of 110 High School Students, 55(50%) were Male and 55 (50%) were Female.

n = 110

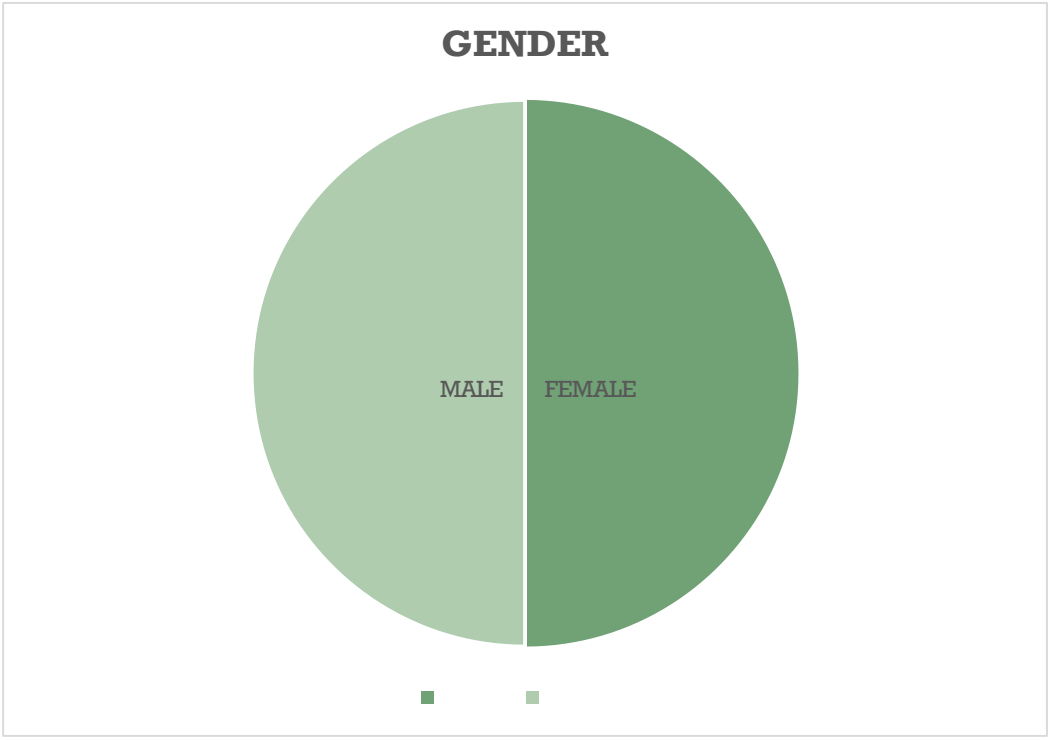


FIGURE – 4
PIE DIAGRAM REPRESENTING PERCENTAGE AND FREQUENCY DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO GENDER.

TABLE 1.3
FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO RELIGION.

n = 110

RELIGION	FREQUENCY (f)	PERCENTAGE (%)
Christianity	0	0
Hinduism	45	40.9
Islam	65	59.1

TOTAL	**110**	**100**

Data presented in **Table 1.3** shows that out of 110 High School Student, majority i .e.,65 (59.1%) were Muslim, 45 (40.9%) were Hindu, and 0 (0%) were Christian .

n = 110

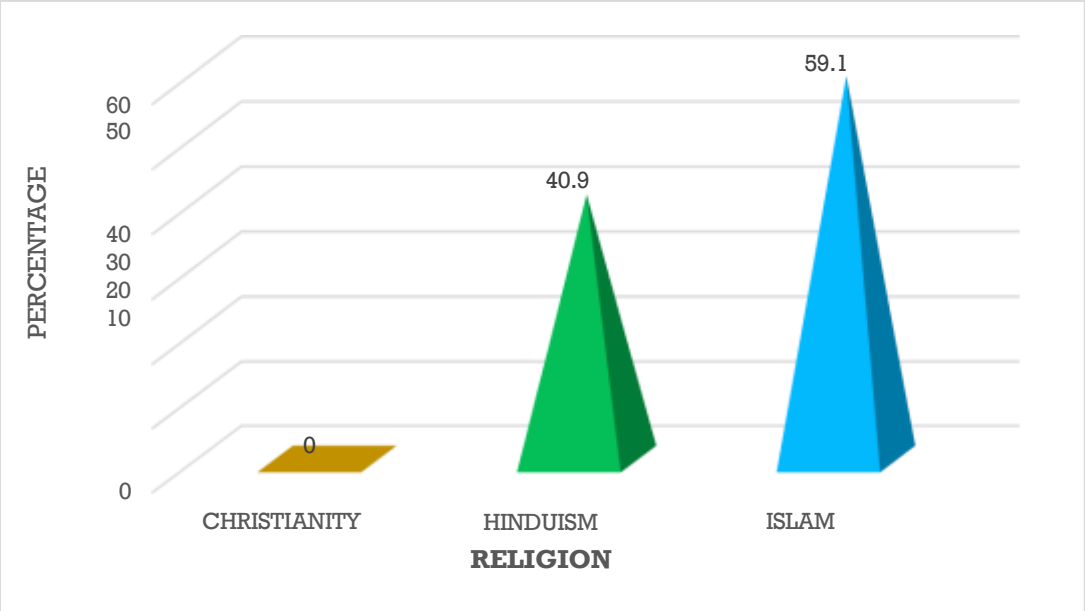


FIGURE- 5
COLUMN DIAGRAM REPRESENTING PERCENTAGE AND FREQUENCY DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO RELIGION.

TABLE 1.4
FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO OCCUPATION OF FATHER.

n =110

OCCUPATION OF FATHER	**FREQUENCY (f)**	**PERCENTAGE (%)**
Government employee	3	2.7
Private employee	34	30.9
Self employed / business	25	22.8
Daily wager	46	41.8
Unemployed	2	1.8
TOTAL	**110**	**100**

Data presented in **Table 1.4** shows the Occupation of Father of the 110 High School Student, 3 (2.7%) was Government employee, 34(30.9%) was Private Employee, 25 (22.8%) was Self-employed , 46 (41.8%) was Daily wager and 2(1.8%) was Unemployed.

n =110

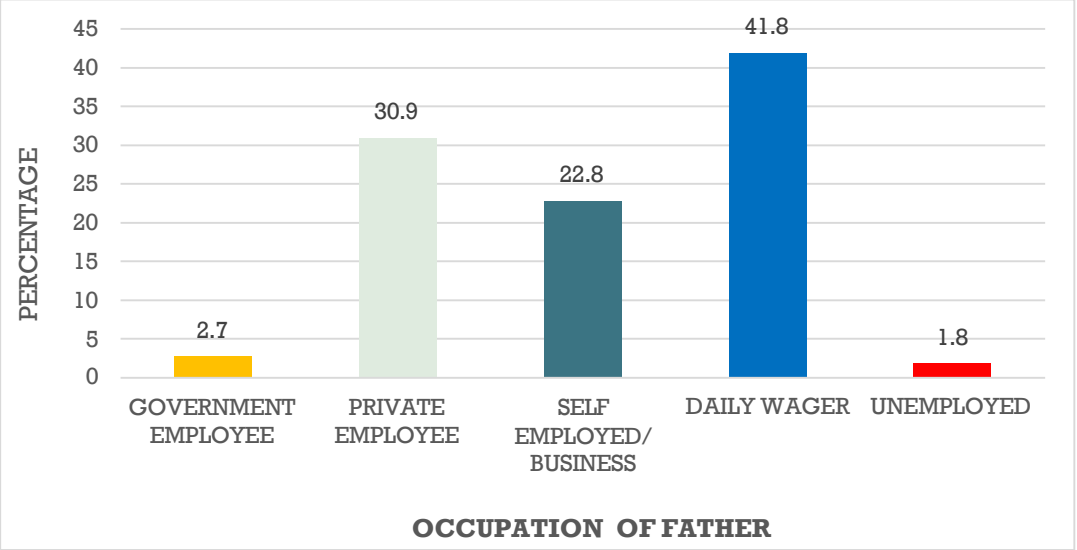


FIGURE- 6

BAR DIAGRAM REPRESENTING PERCENTAGE AND FREQUENCY DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO OCCUPATION OF FATHER.

TABLE 1.5

FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO OCCUPATION OF MOTHER.

n = 110

OCCUPATION OF MOTHER	**FREQUENCY (f)**	**PERCENTAGE (%)**
Government employee	2	1.8
Private employee	25	22.7
Self employed / business	8	7.2
Daily wager	18	16.3
Unemployed	57	51.8
TOTAL	**110**	**100**

Data presented in **Table 1.5** shows the Occupation of Mother of the 110 High School Student, 2 (1.8%) was Government employee, 25 (22.7%) was Private Employee 8 (7.2%) was Self-employed 18 (16.3%) was Daily wager and 57 (51.8%) was Unemployed.

n = 110

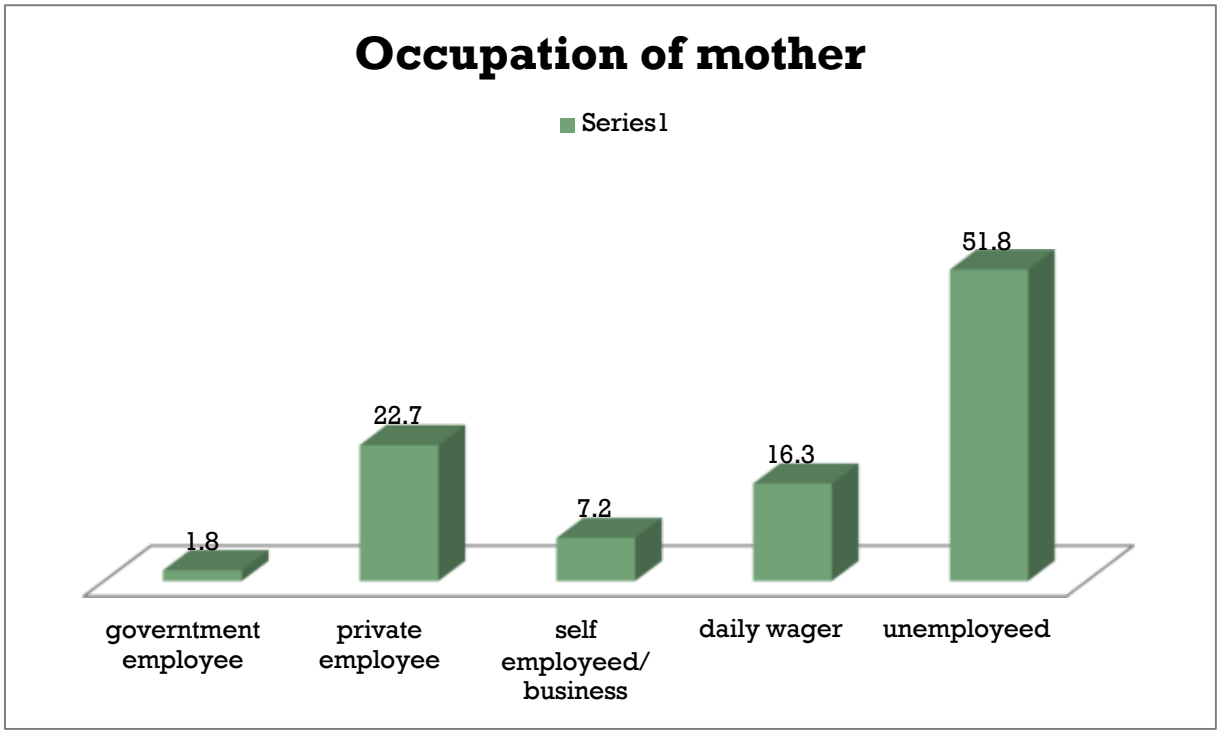


FIGURE- 7

COLUMN DIAGRAM REPRESENTING PERCENTAGE AND FREQUENCY DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO OCCUPATION OF MOTHER.

TABLE 1.6

FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO HAVING ANY MEDICALLY DIAGNOSED SLEEP DISORDER.

n =110

DOYOU HAVE ANY MEDICALLY DIAGNOSED OF SLEEP DISODER	FREQUENCY (f)	PERCENTAGE (%)
Yes	0	0
No	110	100
TOTAL	**110**	**100**

Data presented in **Table 1.6** shows any medically diagnosed sleep disorder of the 110 High School Student .All the high school students i.e., 110 (100%) did not have any sleep disorder.

n =110

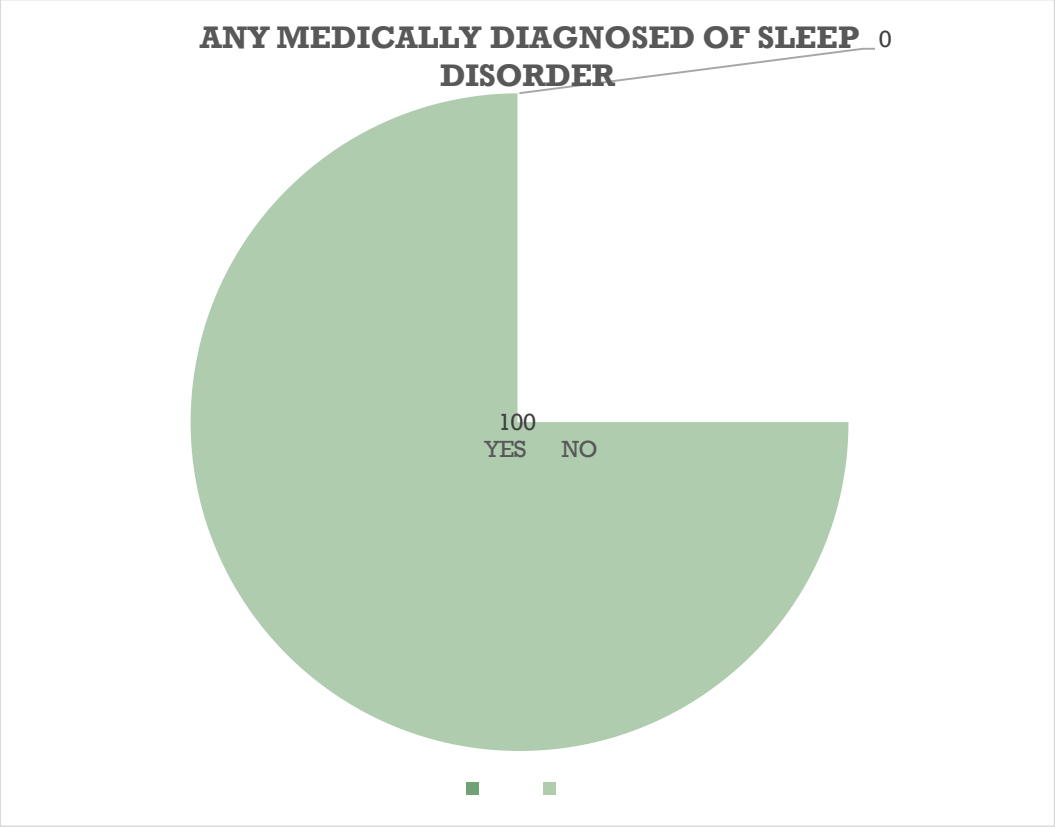


FIGURE - 8

PIE DIAGRAM REPRESENTING FREQUENCY AND PERCENTAGE DISTRIBUTION OF THE HIGH SCHOOL STUDENTS ACCORDING TO HAVING ANY MEDICALLY DIAGNOSED SLEEP DISORDER OF HIGH SCHOOL STUDENT.

TABLE 1.7

FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO THEIR HABITS OF DRINKING COFFEE IN THE EVENING OR BEFORE BEDTIME.

n = 110

DO YOU HAVE ANY HABITS OF DRINKING COFFEE IN THE EVENING OR BEFORE BEDTIME ?	**FREQUENCY (f)**	**PERCENTAGE (%)**
Yes	4	3.6
No	84	76.4
Occasionally	22	20
TOTAL	**110**	**100**

Data presented in **Table 1.7** shows the habit of drinking coffee in the evening or before bedtime of the 110 High School Student. Majority i.e., 84 (76.4%) student do have the habit of drinking coffee in the evening or before bedtime whereas 22 (20%) drinks coffee occasionally in the evening, and 4 (3.6%)

students have the habit of drinking coffee in the evening or before bedtime.

n = 110

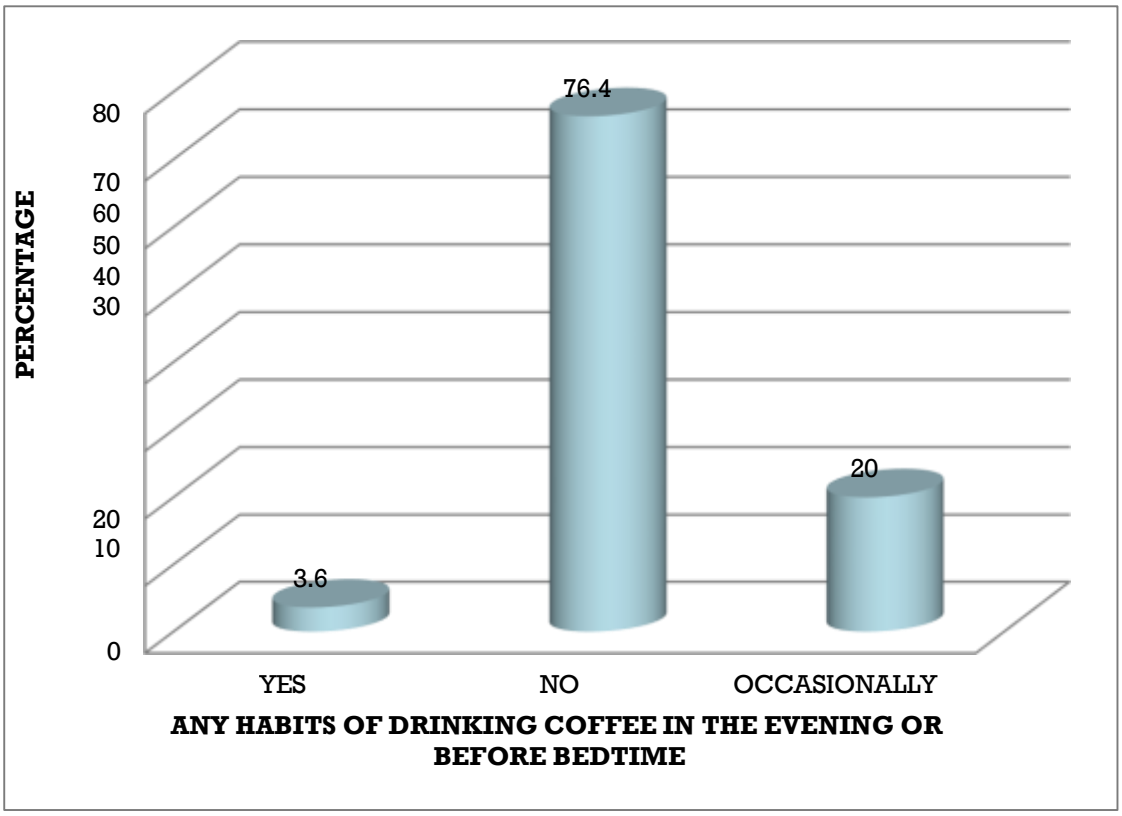


FIGURE-9
COLUMN DIAGRAM REPRESENTING FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO THEIR HABITS OF DRINKING COFFEE IN THE EVENING OR BEFORE BEDTIME.

TABLE 1.8
FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO THEIR HABITS OF DRINKING CAFFEINATED DRINKS IN THE EVENING OR BEFORE BEDTIME.

n = 110

DO YOU HAVE ANY HABITS OF DRINKING CAFFENATED IN THE EVENING OR BEFORE BEDTIME?	**FREQUENCY (f)**	**PERCENTAGE (%)**
Yes	6	5.5
No	97	88.2
Occasionally	7	8.3
TOTAL	**110**	**100**

Data presented in **Table 1.8** shows the habit of drinking coffee in the evening or before bedtime of the 110 High School Student. Majority i.e., 97 (88.2%) student do have any habit of drinking Caffeinated

drinks in the evening or before bedtime whereas 7 (8.3%) drinks caffeinated drinks occasionally in the evening, and 6 (5.5%) students have the habit of drinking Caffeinated drinks in the evening or before bedtime.

n = 110

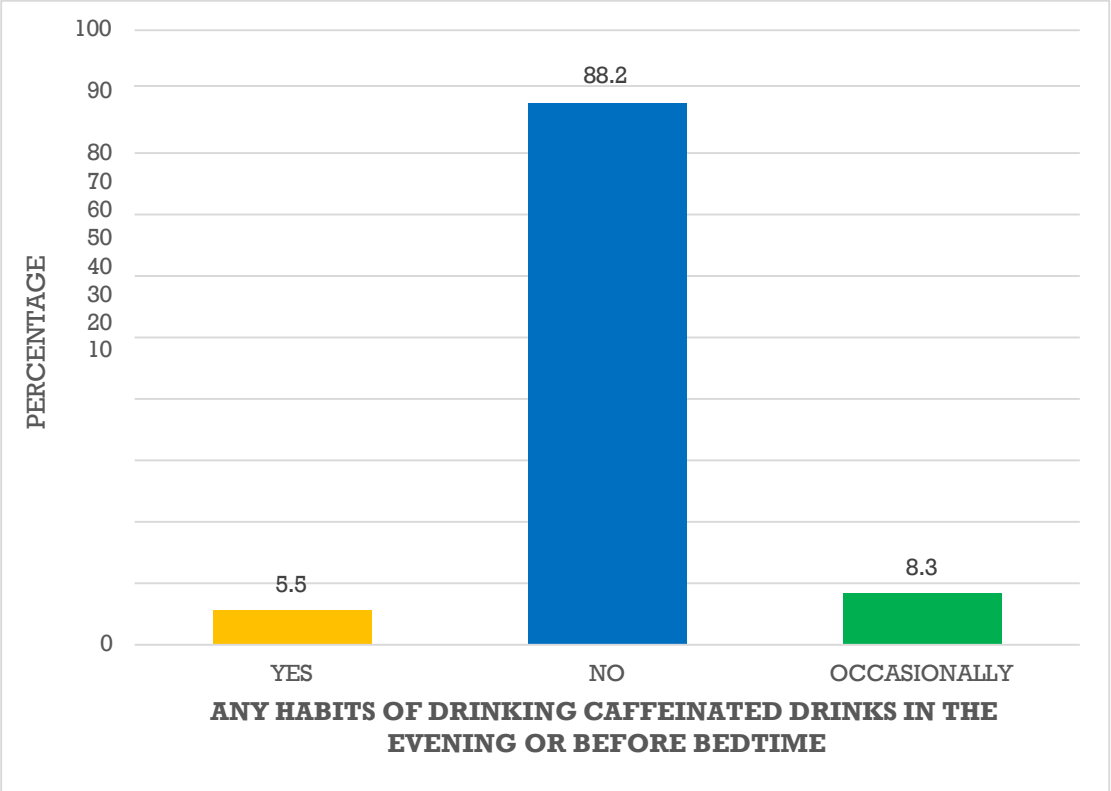


FIGURE-10

BAR DIAGRAM REPRESENTING FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO THEIR HABITS OF DRINKING CAFFEINATED DRINKS IN THE EVENING OR BEFORE BEDTIME.

TABLE 1.9

FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO HAVING ELECTRONIC DEVICE.

n = 110

DOYOU HAVE ANY ELECTRONIC DEVICE?	**FREQUENCY (f)**	**PERCENTAGE (%)**
Yes	91	83.7
No	19	17.3
TOTAL	**110**	**100**

Data presented in **Table 1.9** shows having electronic of the 110 High School Student. Majority i.e., 91 (83.7%) students do have electronic devices and 19 (17.3%) students do not have any electronic devices.

n = 110

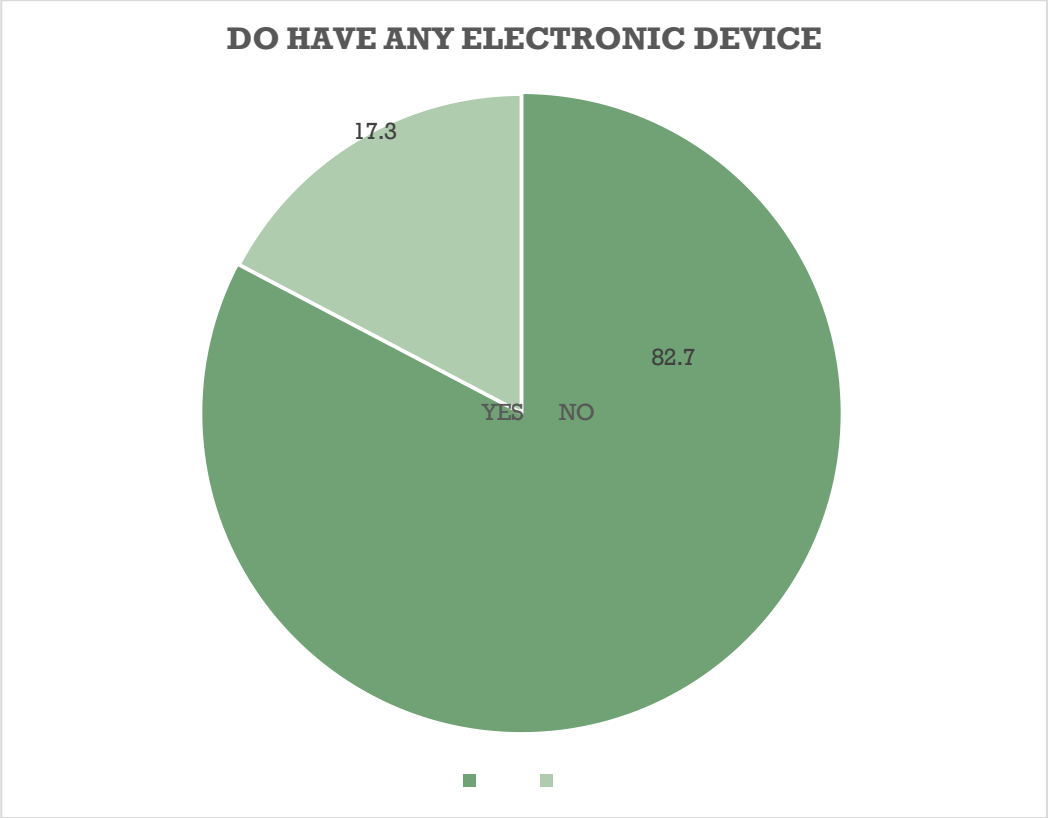


FIGURE-11
PIE DIAGRAM REPRESENTING FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO HAVING ELECTRONIC DEVICES.

TABLE 1.9.1
FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO THEIR DURATION OF USE OF SMARTPHONE

n =110

Smartphone (duration of use)	**Frequency**	**Percentage (%)**
1-2 hours	64	70.32
3-4 hours	14	15.38
More than 4 hours	13	14.28

Data presented in **Table 1.9.1** shows duration of use of Smartphone of High school student. Majority i.e. 64(70.32%) high school student use Smartphone for 1-2 hours, 14(15.38%) high school student use Smartphone for 3-4 hours and 13(14.28%) high school student use Smartphone for more than 4 hours

n =110

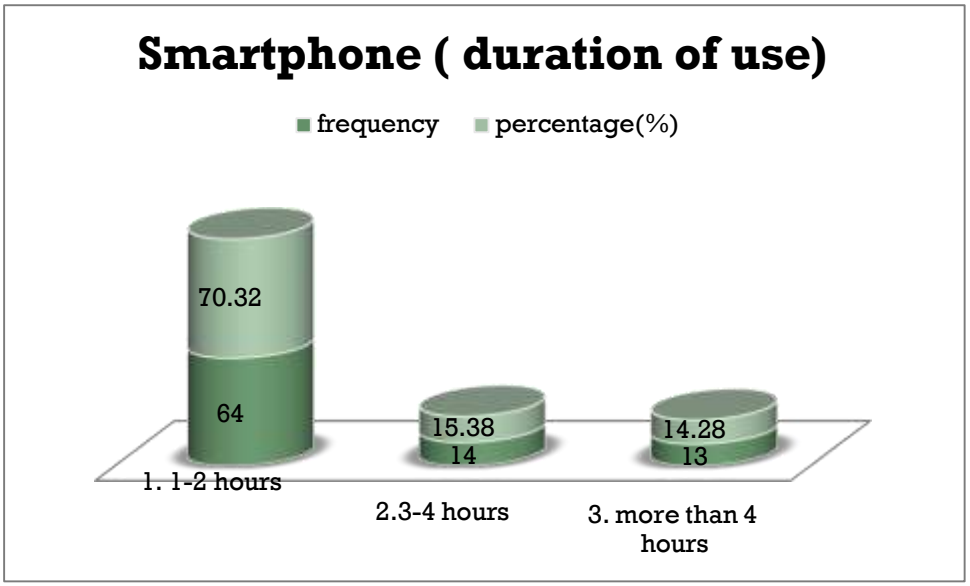


FIGURE 11.1
COLUMN DIAGRAM REPRESENTING FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENT ACCORDING TO THEIR DURATION OF USE OF SMARTPHONE

TABLE 1.9.2
FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO THEIR PURPOSE OF USE OF SMARTPHONE

n = 110

PURPOSE OF USE OF SMARTPHONE	FREQUENCY	PERCENTAGE
Social media and chatting	24	26.37
Games	22	24.17
Educational purpose	42	42.15
Others	3	3.29

Data presented in **Table 1.9.1** shows the purpose of use of Smartphone. Majority i.e. 42(42.15%) High school students use Smartphone for educational purpose, 24 (26.37%) High school students use Smartphone for social media and chatting purpose, 22(24.17%) High school students use Smartphone for Gamming purpose and 3(3.29%) High school students use Smartphone for other purpose.

n = 110

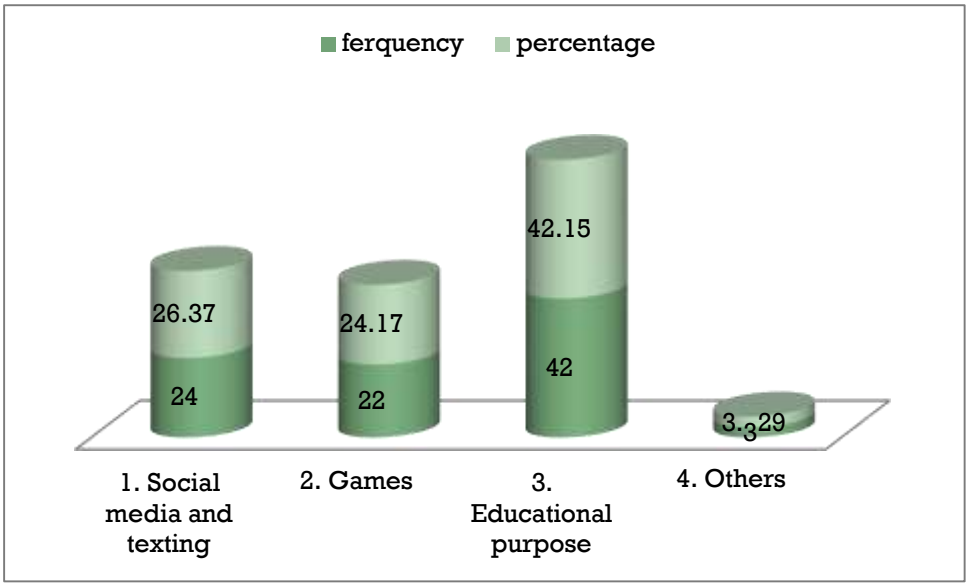


FIGURE 11.2
COLUMN DIAGRAM REPRESENTING FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO THEIR PURPOSE OF USE OF SMARTPHONE.

TABLE 1.9.3
FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO THEIR DURATION OF USE OF TELEVISION

n =110

Television (duration of use)	**Frequency**	**Percentage (%)**
1-2 hours	37	68.51
3-4 hours	12	22.22
More than 4 hours	5	9.25

Data presented in **Table 1.9.3** shows duration of use of Television of High school student. Majority i.e. 37(68.51%) high school student use Television for 1-2 hours, 12(22.22%) high school student use Television for 3-4 hours and 5(9.25%) high school student use Television for more than 4 hours.

n =110

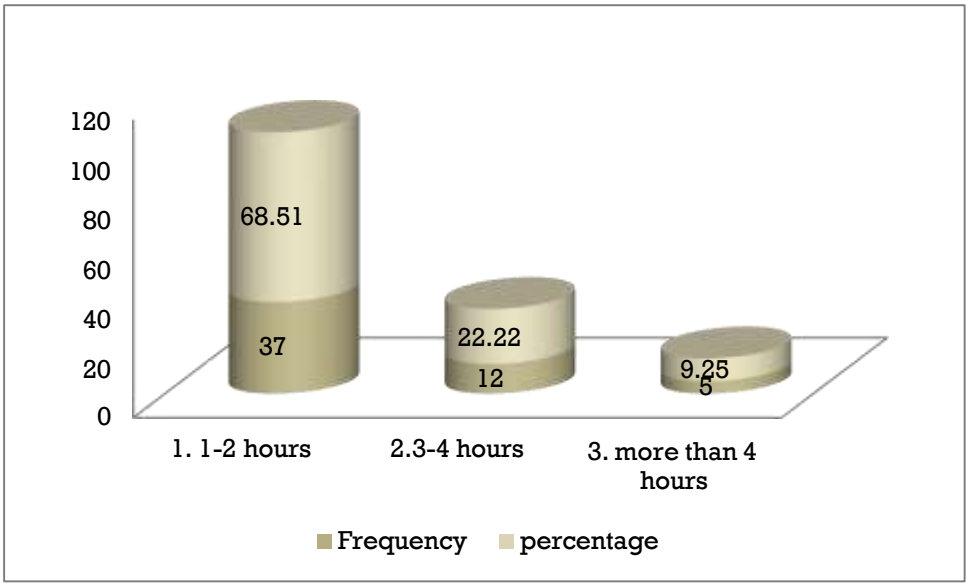


FIGURE 11.3
COLUMN DIAGRAM REPRESENTING FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO THEIR DURATION OF USE OF TELEVISION.

TABLE 1.9.4
FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO THEIR DURATION OF USE OF LAPTOP
n =110

Laptop (duration of use)	**Frequency**	**Percentage (%)**
1-2 hours	27	83.87
3-4 hours	3	9.67
More than 4 hours	2	6.45

Data presented in **Table 1.9.4** shows duration of use of Laptop of High school student. Majority i.e. 27(83.87%) high school student use Laptop for 1-2 hours, 3(9.67%) high school student use Laptop for 3-4 hours and 2(6.45%) high school student use Laptop for more than 4 hours.

n =110

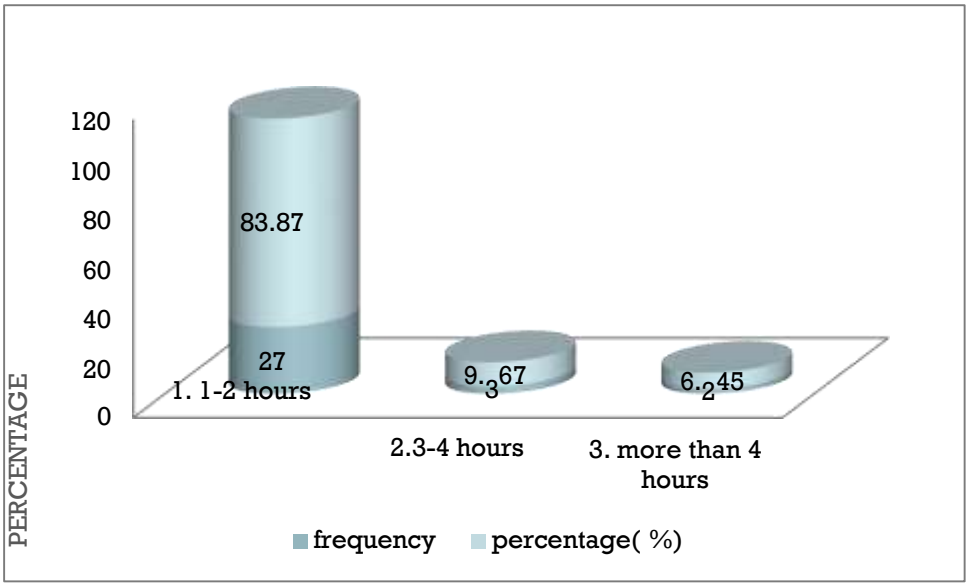


FIGURE 11.4
COLUMN DIAGRAM REPRESENTING FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO THEIR DURATION OF USE OF LAPTOP.

TABLE 1.10
FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO THEIR SLEEP DURATION AT NIGHT.

n = 110

YOUR SLEEP DURATION AT NIGHT	FREQUENCY (f)	PERCENTAGE (%)
< 3 hours	1	0.9
3 - 5 hours	17	15.5
6-8 hours	64	58.1
>8 hours	28	25.5
TOTAL	**110**	**100**

Data presented in **Table 1.10** shows the sleep duration of the 110 High School Student at night. Among them 1 (0.9%) students do have < 3 hours of sleep at night, 17 (15.5%) students have 3-5 hours sleep , 64 (58.1%) students have 6-8 hours sleep and 28 (25.5%) students having > 8 hours sleep at night.

n = 110

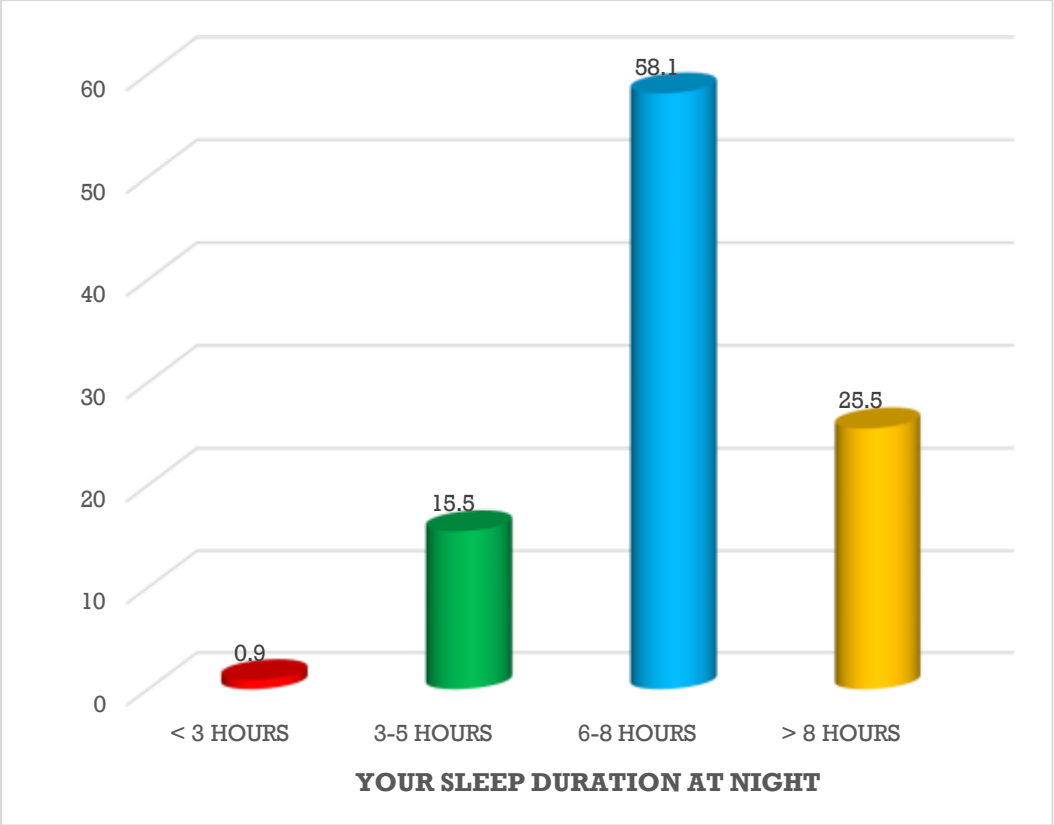


FIGURE-12
BAR DIAGRAM REPRESENTING FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO THEIR SLEEP DURATION AT NIGHT.

TABLE 1.11
FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO THE TYPE OF FAMILY.
n =110

TYPE OF FAMILY	FREQUENCY (f)	PERCENTAGE (%)
Nuclear family	86	78.2
Extended family	6	5.5
Joint family	18	16.3
TOTAL	**110**	**100**

Data presented in **Table 1.11** shows the Type of family of the 110 High School Student. Among them majority i.e. 86 (78.2%) students belong to a nuclear family, 6 (5.5%) students belong to a extended family and 18 (16.3%) belong to a joint family.

n =110

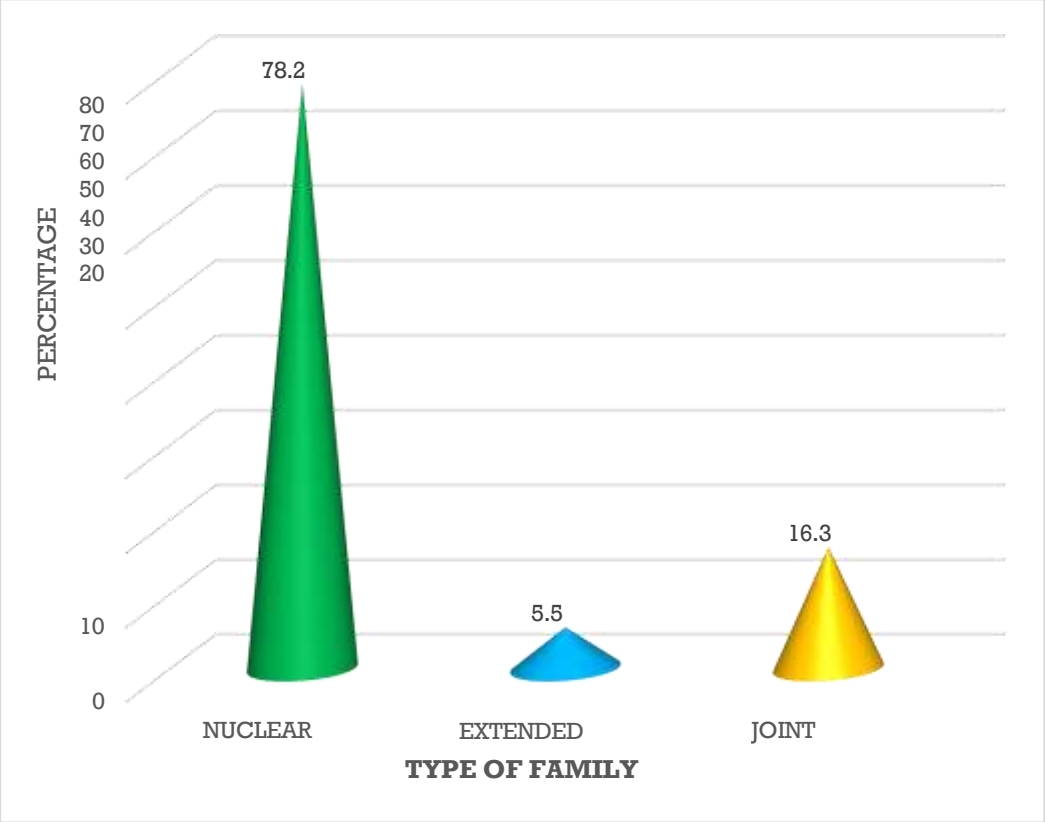


FIGURE -13
COLUMN DIAGRAM REPRESENTING FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO THE TYPE OF FAMILY.

TABLE 1.12
FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO TOTAL NUMBER CHILDREN IN THE FAMILY.

n =110

TOTAL NUMBER OF CHILDREN IN YOUR FAMILY	FREQUENCY (f)	PERCENTAGE (%)
1	17	15.5
2	46	41.8
3	30	27.2
4 or more	17	15.5
TOTAL	**110**	**100**

Data presented in **Table 1.12** shows the Total number of children in family of the 110 High School Student. 17 (15.5%) students having only 1 children in their family, 46 (41.8%) students having 2 children in their family, 30 (27.2%) students have total 3 children family and 17 (15.5%) students are having more than 4 children in their family.

n =110

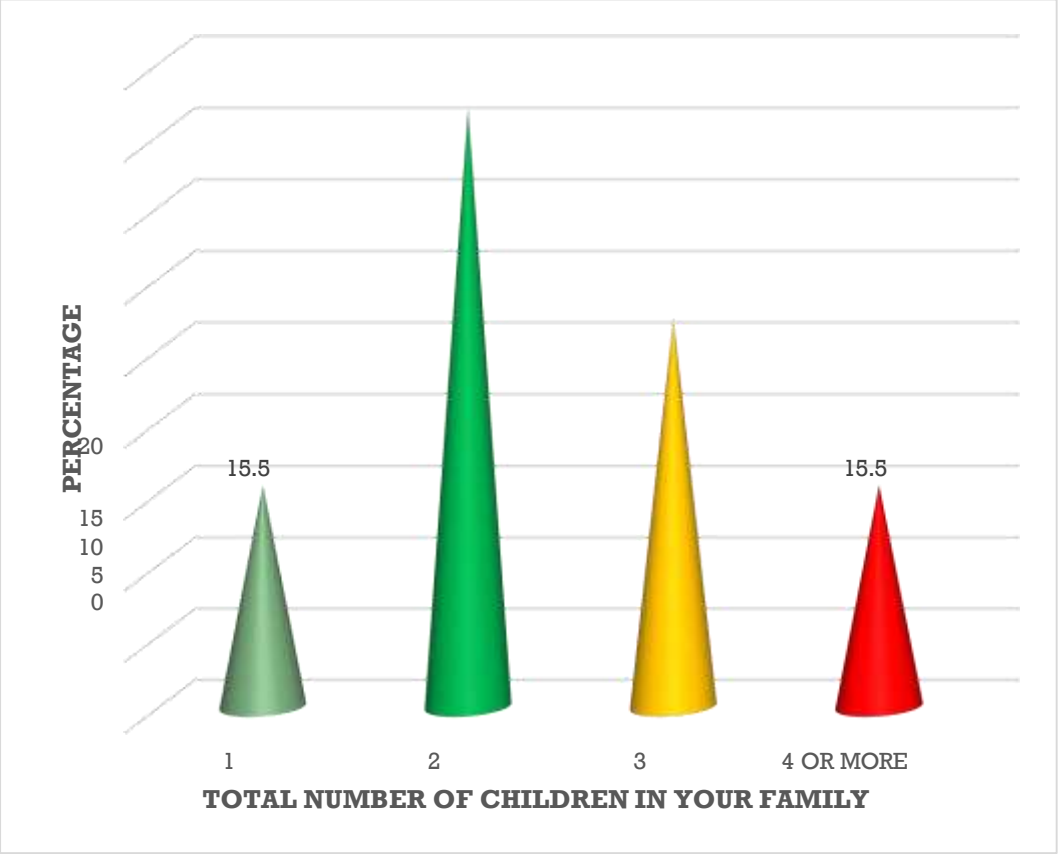


FIGURE-14

COLUMN DIAGRAM REPRESENTING FREQUENCY AND PERCENTAGE DISTRIBUTION OF HIGH SCHOOL STUDENTS ACCORDING TO TOTAL NUMBER CHILDREN IN THE FAMILY.

4.4.2.1 SECTION II,A: DESCRIPTION OF FREQUENCY AND PERCENTAGE DISTRIBUTION OF LEVEL OF KNOWLEDGE REGARDING SLEEP HYGIENE OF STUDENTS AMONG THE HIGH SCHOOL STUDENTS BEFORE AND AFTER IMPLEMENTATION OF EDUCATIONAL PROGRAM.

This section presents data regarding the level of knowledge of High school students regarding sleep hygiene before and after implementation of educational program. The level of knowledge is categorized into three levels, i.e. inadequate knowledge (≤ 6), moderate knowledge (7-12), adequate knowledge (13-18) . Thus the section shows the frequency and percentage distribution of level of knowledge regarding sleep hygiene of students among the High school students before and after implementation of educational program.

TABLE- 2.1

n =110

LEVEL OF KNOWLEDGE	Pre-Test		Post-Test	
	f	%	f	%

Inadequate knowledge	59	53.6	0	0
Moderate knowledge	41	37.3	34	30.9
Adequate knowledge	10	9.1	76	69.1

Table 2.1 depicts the pre-test and post-test level of knowledge regarding Sleep hygiene of students among high school students. Results revealed that in pretest majority 59(53.6%) had Inadequate knowledge, 41(37.3%) had moderate knowledge and 10(9.1%) had adequate knowledge where as in post test majority 76 (69.1%) had adequate knowledge and 34(30.9%) had moderate knowledge regarding Sleep hygiene of students among high school students.

n =110

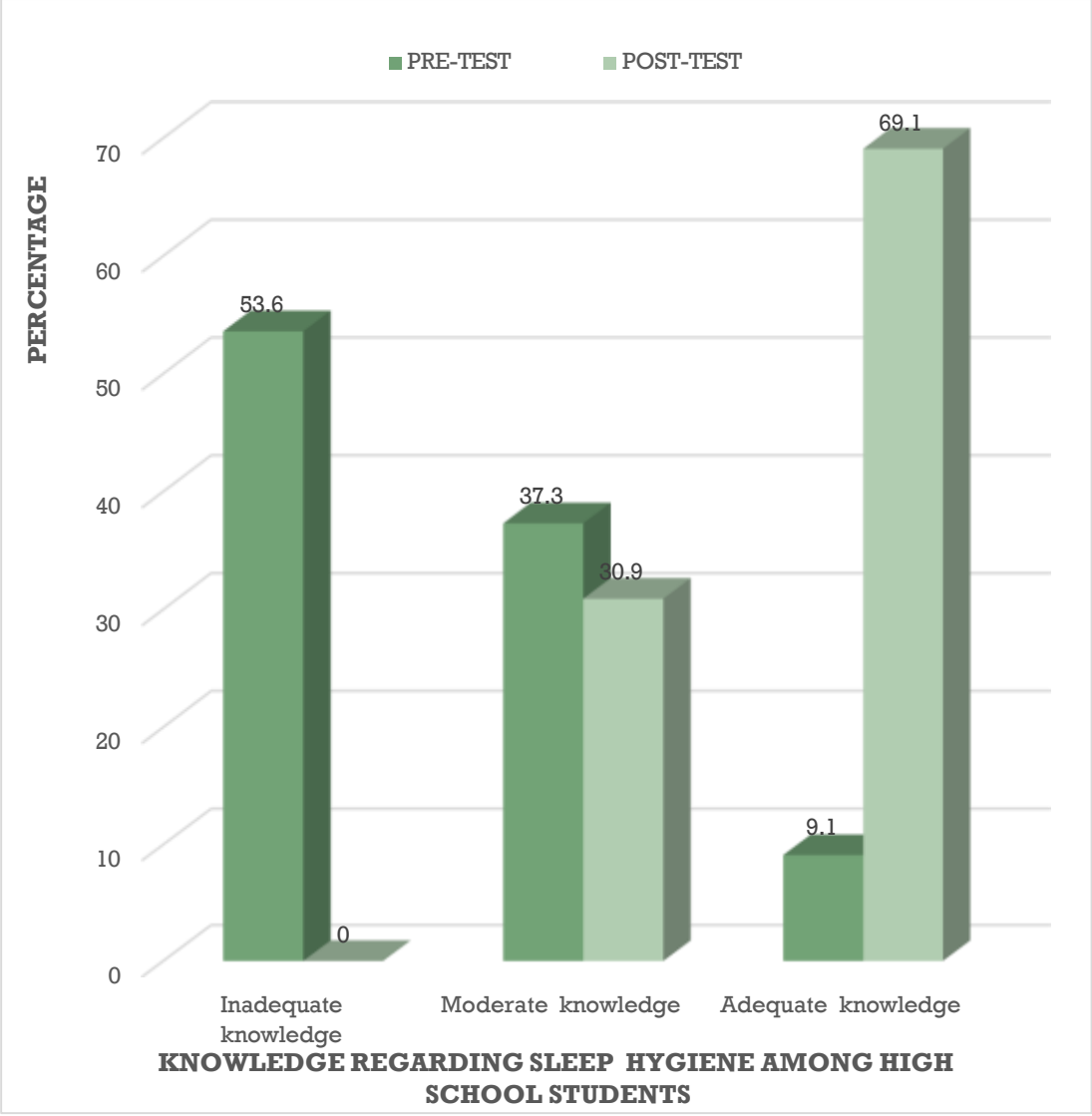


FIGURE-15

BAR DIAGRAM REPRESSENTING FREQUENCY AND PERCENTAGE DISTRIBUTION OF LEVEL OF KNOWLEDGE REGARDING SLEEP HYGIENE OF STUDENTS AMONG THE HIGH SCHOOL STUDENTS BEFORE AND AFTER IMPLEMENTATION OF

EDUCATIONAL PROGRAM.

4.4.2.2 : SECTION II.B: EFFECTIVENESS OF EDUCATIONAL PROGRAM ON THE LEVEL OF KNOWLEDGE REGARDING SLEEP HYGIENE OF SSTUDENTS AMONG THE HIGH SCHOOL STUDENTS.

This section deals with the findings related to assess the difference between pre-test and post-test knowledge score. Mean standard deviation and paired t-test values were computed to assess the difference between pre-test and post-test score about Sleep Hygiene of students.

In order to find out the effect of Educational Program regarding knowledge on Sleep Hygiene, the following hypothesis was stated.

H_1: There will be a significant difference between pre-test and post-test knowledge scores regarding sleep hygiene of students among the high school students in selected high school, Guwahati, Assam at 0.05 level of significance.

TABLE 2.2

n =110

EFFECTIVENESS	MEAN	SD	MEAN DIFFERENCE	t value	df	P value
PRE-TEST KNOWLEDGE	7.40	3.09	5.69	15.40	109	0.001*
POST TEST KNOWLEDGE	13.10	2.50				

***p<0.05 level of significance**

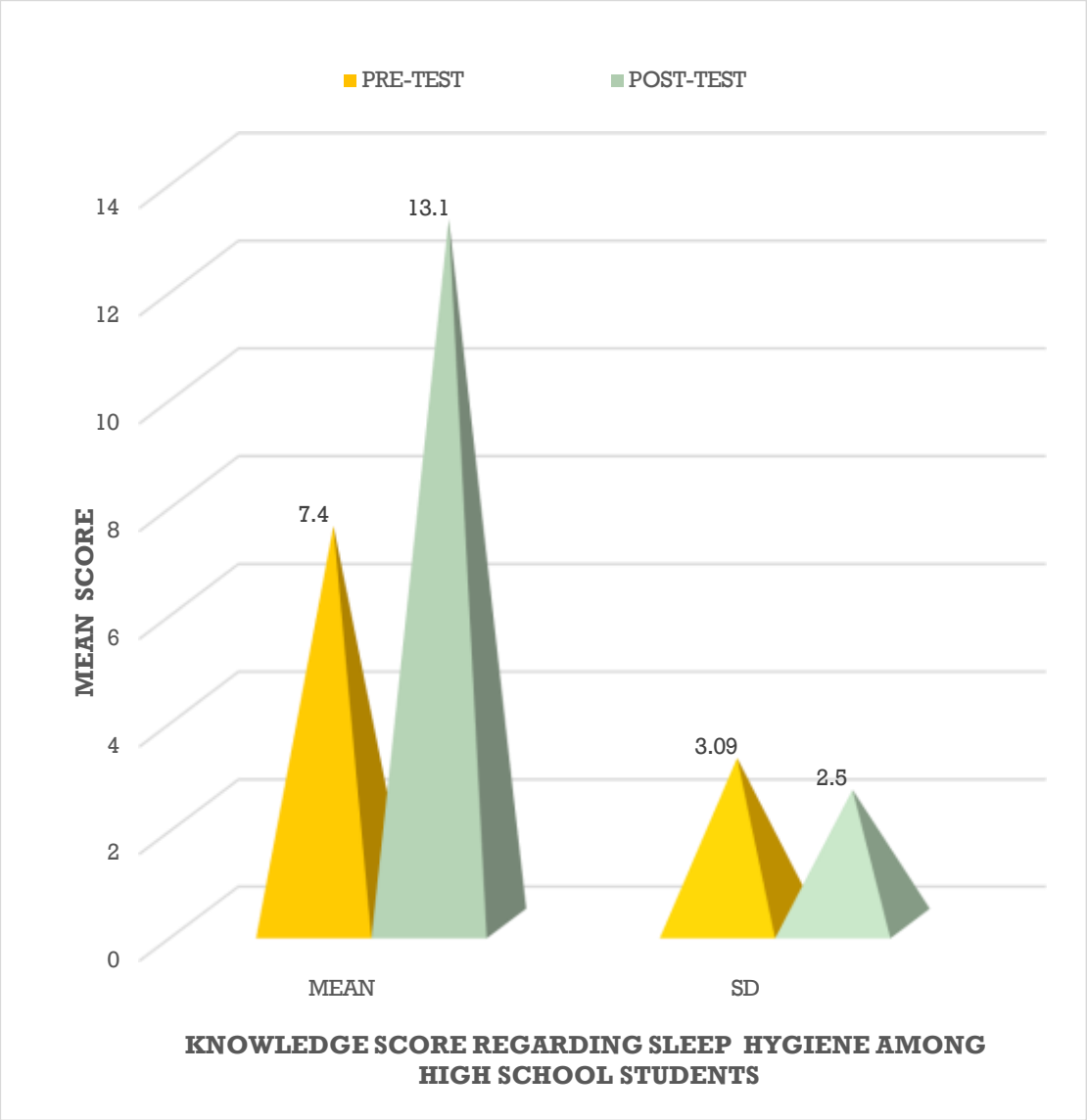
Table 2.2 depicts the effectiveness of educational program by comparing the pretest and posttest scores of Knowledge on Sleep hygiene among high school students which was tested by using paired t test.

Results regarding knowledge showed that mean post-test knowledge score was 13.10±2.50 higher than mean pre-test knowledge score 7.40±3.09 with mean difference of

5.69 and obtained (t value=15.40, df=109, p=0.001) was found statistically highly significant at p<0.05 level.

Findings indicate that educational program was effective in improving the Knowledge on Sleep hygiene among high school students.

Hence the findings accepted the research hypothesis.



n =110

FIGURE-16

COLUMN DIAGRAM REPRESENTING EFFECTIVENESS OF EDUCATIONAL PROGRAM ON THE LEVEL OF KNOWLEDGE REGARDING SLEEP HYGIENE OF STUDENTS AMONG THE HIGH SCHOOL STUDENTS .

4.4.3.1 SECTION III.A: DESCRIPTION OF FREQUENCY OF PERCENTAGE DISTRIBUTION OF ATTITUDE REGARDING SLEEP HYGIENE OF STUDENTS AMONG HIGH SCHOOL STUDENTS.

This section presents data regarding the Attitude of High school students regarding sleep hygiene of students before and after implementation of educational program. Attitude is categorized into two levels, i.e. positive attitude (1-20) and negative attitude {0-(-20)}. Thus the section shows the frequency and percentage distribution of level of knowledge regarding sleep hygiene of students among the High school students before and after implementation of educational program.

TABLE 3.1

n =110

LEVEL OF ATTITUDE	Pre-Test		Post-Test	
	f	%	F	%
Positive attitude	47	42.7	110	100
Negative attitude	63	57.3	0	0

***p<0.05 level of significance**

Table 3.1 depicts the pre-test and post-test level of attitude regarding Sleep hygiene among high school students . Results revealed that in pre-test maximum of high school students 63(57.3%) had negative attitude and 47(42.7%) had positive attitude where as in post-test all 110(100%) of high school students had positive attitude regarding Sleep hygiene.

n =110

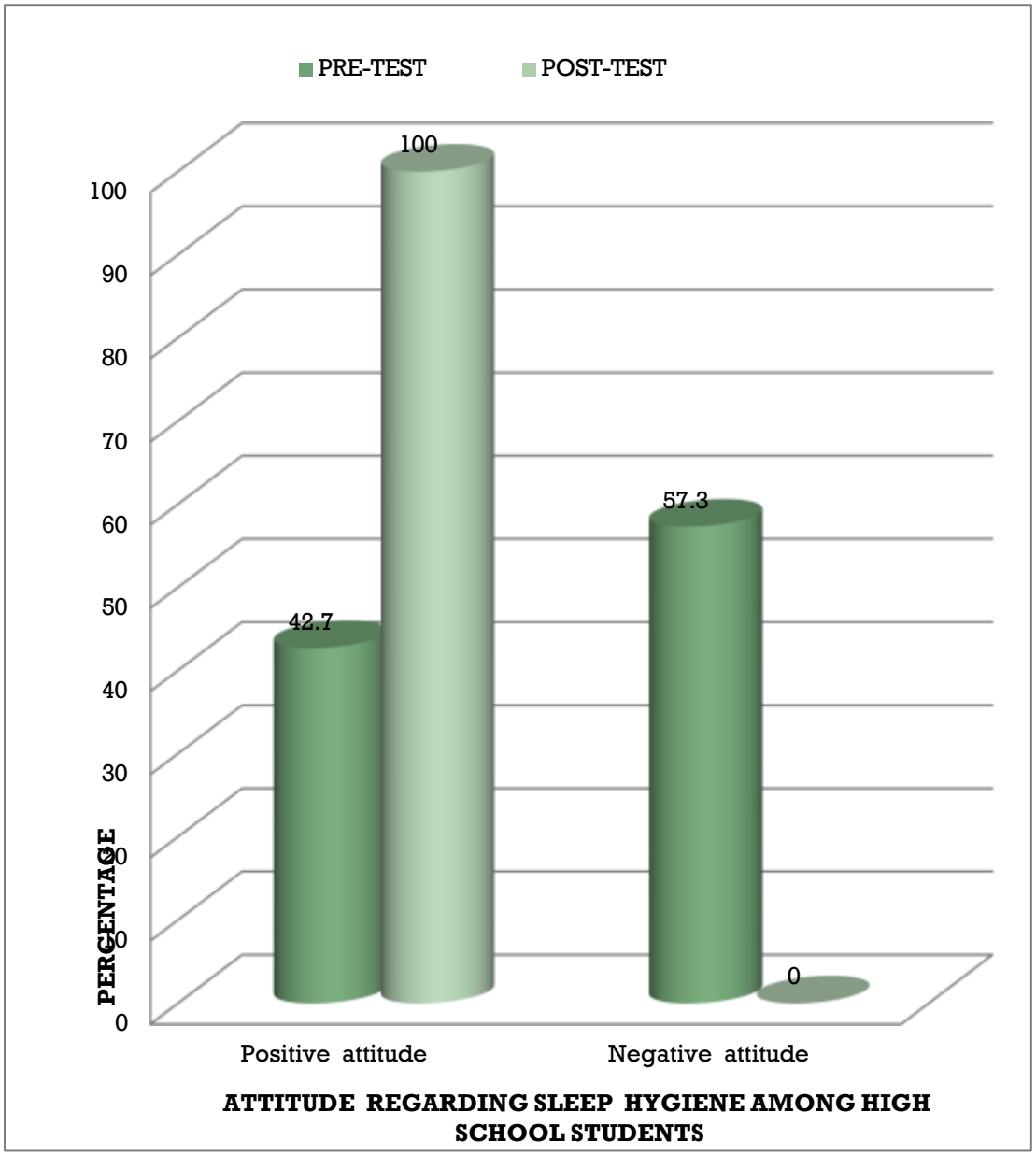


FIGURE 17

COLUMN DIAGRAM REPRESSENTING FREQUENCY OF PERCENTAGE DISTRIBUTION OF ATTITUDE REGARDING SLEEP HYGIENE OF STUDENTS AMONG HIGH SCHOOL STUDENTS

4.4.3.2 SECTION III.B: EFFECTIVENESS OF EDUCATIONAL PROGRAM ON ATTITUDE REGARDING SLEEP HYGIENE OF STUDENTS AMONG THE HIGH SCHOOL STUDENTS.

This section deals with the findings related to assess the difference between pre-test and post-test Attitude score. Mean standard deviation and paired t-test values were computed to assess the difference between pre-test and post-test score about Sleep Hygiene.

In order to find out the effect of Educational Program regarding knowledge on Sleep Hygiene, the following hypothesis was stated.

H2: There will be a significant difference between pre-test and post-test attitude scores regarding sleep hygiene of students among the high school students in selected high school , Guwahati, Assam at 0.05 level of significance.

TABLE 3.2

n =110

Effectiveness	Mean	SD	Mean Difference	t value	df	P value
Pre test Attitude	1.59	2.39	4.60	15.28	109	0.001*
Post test Attitude	6.20	3.13				

***p<0.05 level of significance**

Table 3.2 depicts the effectiveness of educational program on attitude regarding Sleep hygiene of students among high school students which was tested by using paired t test.

Results regarding attitude showed that mean post-test attitude score was 6.20±3.13 higher than mean pre-test attitude score 1.59±2.39 with mean difference of 4.60 and obtained (t value=15.28, df=109, p=0.001) was found statistically highly significant at p<0.05 level.

Findings indicate that educational program was effective in improving the attitude on Sleep hygiene among high school students.

Hence, the findings accepted the research hypothesis .

n =110

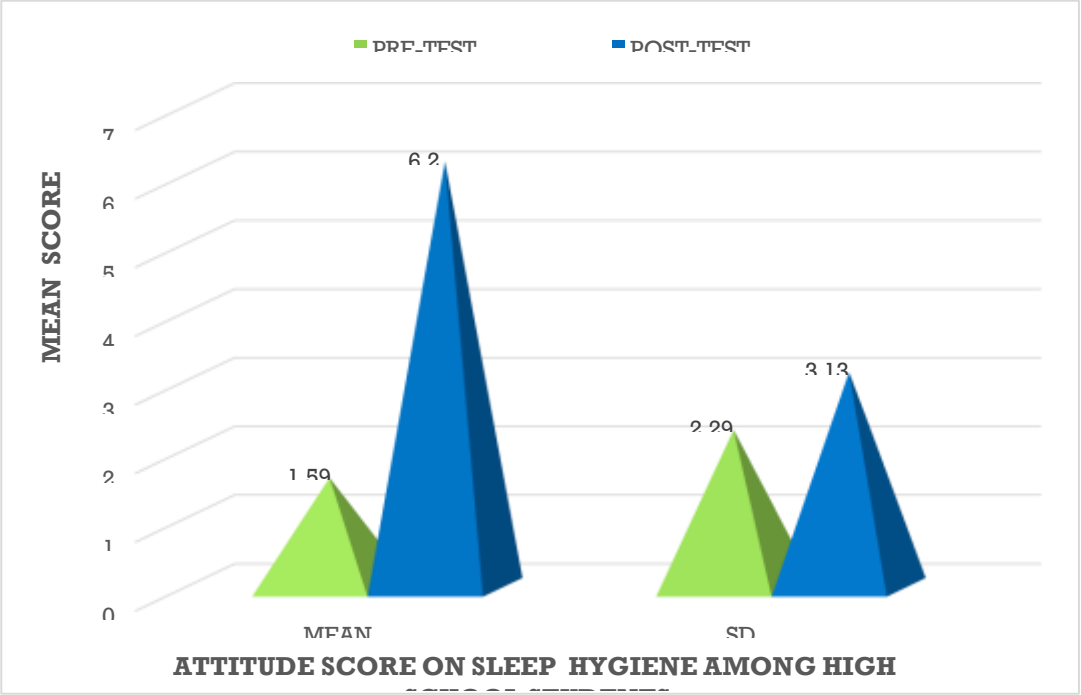


FIGURE 18

COLUMN DIAGRAM REPRESSENTING EFFECTIVENESS OF EDUCATIONAL PROGRAM ON ATTITUDE REGARDING SLEEP HYGIENE OF SSTUDENTS AMONG THE HIGH SCHOOL STUDENTS.

4.4.4 SECTION IV: CORRELATION BETWEEN PRE TEST SCORES OF KNOWLEDGE AND ATTITUDE REGARDING SLEEP HYGIENE OF STUDENTS AMONG THE HIGH SCHOOL STUDENTS.

This section deals with the findings related to assess the correlation between pre-test Knowledge and Attitude score. In this section Karl Pearson's correlation formula is used to measure the correlation between pre-test Knowledge and Attitude score.

In order to find out the correlation between pre-test Knowledge and Attitude score, the following hypothesis was stated.

H3: There will be a significant correlation between pre-test scores of knowledge and attitude regarding sleep hygiene of students among the high school students in selected high school Guwahati, Assam .

TABLE-4

n =110

Correlation	r value	P value
Knowledge		
Attitude	0.081	0.402

***p<0.05 level of significance**

Table 4 depicts the correlation between pretest scores of knowledge and attitude on Sleep hygiene among high school students which was measured by Karl Pearson correlation formula. Result revealed that (r=0.081, p=0.402) indicate weak positive correlation pretest scores of knowledge and attitude on Sleep hygiene of students among high school students and was found to be statistically non significant.

Hence, the findings rejected the research hypothesis.

n =110

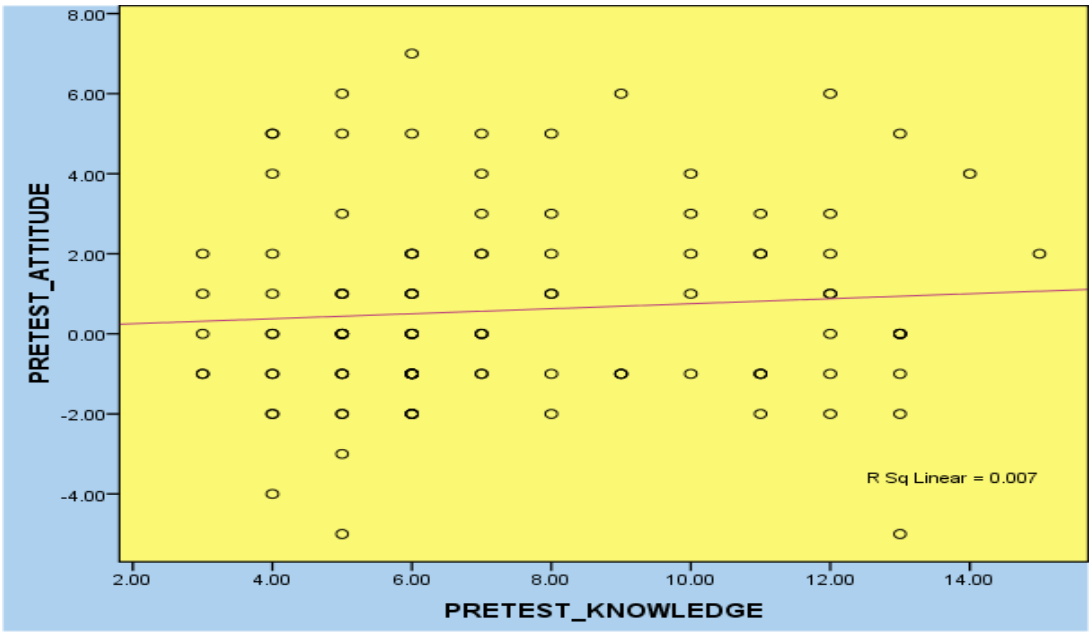


FIGURE 19

XY SCATTER DIAGRAM REPRESSENTING THE CORRELATION BETWEEN PRE TEST

KNOWLEDGE AND ATTITUDE REGARDING SLEEP HYGIENE OF STUDENTS.

4.4.5.1 SECTION V.A: ASSOCIATION BETWEEN PRE TEST KNOWLEDGE REGARDING SLEEP HYGIENE OF STUDENTS AMONG THE HIGH SCHOOL STUDENTS WITH THE SELECTED SOCIO DEMOGRAPHIC VARIABLES.

This section deals with the findings related to assess the association between pre-test Knowledge regarding Sleep Hygiene of students among the high school with selected socio demographic variables. In this section Chi square test is used to find the association between pre-test Knowledge of students with selected socio demographic variables.

In order to find out the association between pre-test Knowledge regarding Sleep Hygiene of students among the high school with selected socio demographic variables, the following hypothesis was stated.

H4: There will be a significant association between pre-test knowledge score with selected socio demographic variables.

TABLE 5.1

n =110

S. No	Socio-demographic Variables	Pre-test knowledge			χ2 value	df	p value
		Inadequate	Moderate	Adequate			
1	Age of participant in years						
	a) 12-13 years	9	2	0	3.639	4	0.434^{NS}
	b) 14-15 years	33	24	7			
	c) Above 15 years	17	15	3			
2	Gender						
	a) Male	31	21	3	1.724	2	0.508^{NS}
	b) Female	28	20	7			
3	Religion						
	a) Christianity	--25	--17	--3	0.521	2	0.844^{NS}
	b) Hinduism	34	24	7			
	c) Islam						
4	Occupation of father						
	a) Government employee	3	0	0	7.011	8	0.472^{NS}
	b) Private employee	17	11	6			
	c) Self employed / business	14	9	2			
		24	20	2			
	d) Daily wager	1	1	0			
	e) Unemployed						
5	Occupation of mother						
	a) Government employee	2	0	0	7.95	8	0.439^{NS}
	b) Private employee	12	11	2			
	c) Self employed / business	5	1	2			
		11	7	0			
	d) Daily wager	29	22	6			
	e) Unemployed						

6	Do you have any medically diagnosed of sleep disorder? a) Yes b) No	--59	--41	--10	NA	NA	NA
7	Do you have any habits of drinking coffee in the evening or before bedtime? a) Yes b) No c) Occasionally	4 43 12	0 33 8	0 8 2	2.913	4	0.600^{NS}
8	Do you have any habits of drinking caffeinated drinks in the evening or before bedtime? a) Yes b) No c) Occasionally	4 50 5	2 37 2	0 10 0	1.153	3	0.951^{NS}
9	Do you have any						

	electronic device? a) Yes b) No	 46 13	 37 4	 8 2	2.739	2	0.263^{NS}
10	Your sleep duration at night - a) < 3 hours b) 3 - 5 hours c) 6 - 8 hours d) > 8 hours	 1 8 33 17	 0 7 23 11	 0 2 8 0	6.115	6	0.420^{NS}
11	Type of your family - a) Nuclear b) Extended c) Joint	 45 3 11	 32 3 6	 9 0 1	0.999	4	0.913^{NS}
12	Total number of children in your family a) 1 b) 2 c) 3 d) 4 or more	 9 27 16 7	 5 16 13 7	 3 3 1 3	5.600	6	0.459^{NS}

***p value < 0.05 level of significance** **NS-Non Significant**

Table 5.1 depicts the association between pre-test knowledge regarding Sleep hygiene among high school students with their selected socio-demographic variables which was tested by using chi-square test. Result revealed that, socio-demographic variables such as Age of Participant (in years), Gender, Religion , Occupation of father, Occupation of mother, Do you have any medically diagnosed of sleep disorder (**The variable history of medically diagnosed sleep disorder could not be tested for association, as none of the high school students reported having any medically diagnosed sleep disorder; therefore, chi-square value, test value, and p-value were not applicable (N/A)** , Do you have any habits of drinking coffee in the evening or before bedtime, Do you have any habits of drinking caffeinated drinks in the evening or before bedtime, Do you have any electronic device, Your sleep duration at night, Type of your family and Total number of children in your family were not found any significant association at $p<0.05$ level with pre-test knowledge regarding Sleep hygiene among high school students.

Hence, the findings rejected the research hypothesis.

4.4.5.2 SECTION V.B: ASSOCIATION BETWEEN PRE TEST ATTITUDE REGARDING SLEEP HYGIENE OF STUDENTS AMONG THE HIGH SCHOOL STUDENTS WITH THE SELECTED SOCIO DEMOGRAPHIC VARIABLES.

This section deals with the findings related to assess the association between pre-test atitude regarding Sleep Hygiene of students among the high school with selected socio demographic variables. In this section Chi square test is used to find the association between pre-test attitude of students with selected socio demographic variables.

In order to find out the association between pre-test attitude regarding Sleep Hygiene of students among the high school with selected socio demographic variables, the following hypothesis was stated.

H5: There will be a significant association between pre-test attitude score with selected socio demographic variables.

TABLE 5.2

n =110

S. No	Socio-demographic Variables	Pre-test attitude		χ2 value	df	p value
		Positive	Negative			
1	Age of participant in years a) 12-13 years b) 14-15 years c) Above 15 years	 3 28 16	 8 36 19	1.171	2	0.555^{NS}
2	Gender a) Male b) Female	 26 21	 29 34	0.929	1	0.335^{NS}
3	Religion a) Christianity b) Hinduism c) Islam	 --14 33	 --31 32	3.199	1	0.081^{NS}
4	Occupation of father a) Government employee b) Private employee c) Self employed / business d) Daily wager e) Unemployed	 1 13 8 23 2	 2 21 17 23 0	5.240	4	0.265^{NS}
5	Occupation of mother a) Government employee b) Private employee c) Self employed / business d) Daily wager e) Unemployed	 1 11 3 8 24	 1 14 5 10 33	0.179	4	0.996^{NS}
6	Do you have any medically diagnosed of sleep disorder ? a) Yes b) No	--47	--63	NA	NA	NA
7	Do you have any habits of drinking coffee in the evening or before bedtime? a) Yes b) No	 1 39 7	 3 45 15	1.951	2	0.377^{NS}

	c) Occasionally					
8	Do you have any habits of drinking caffeinated drinks in the evening or before bedtime? a) Yes b) No c) Occasionally	 3 42 2	 3 55 5	 0.759	 2	 0.817^{NS}
9	Do you have any electronic device?					

	a) Yes b) No	42 5	49 14	2.642	1	0.104^{NS}
10	Your sleep duration at night a) < 3 hours b) 3 - 5 hours c) 6 - 8 hours d) > 8 hours	 1 7 26 13	 0 10 38 15	1.603	3	0.732^{NS}
11	Type of your family - a) Nuclear b) Extended c) Joint	 36 5 6	 50 1 12	4.437	2	0.114^{NS}
12	Total number of children in your family - a) 1 b) 2 c) 3 d) 4 or more	 8 18 13 8	 9 28 17 9	0.604	3	0.914^{NS}

***p value < 0.05 level of significance** **NS-Non Significant**

Table 5.2 depicts the association between pre-test attitude regarding Sleep hygiene among high school students with their selected socio-demographic variables which was tested by using chi-square test. Result revealed that socio-demographic variables such as Age of Participant (in years), Gender, Religion , Occupation of father , Occupation of mother, Do you have any medically diagnosed of sleep disorder (**The variable history of medically diagnosed sleep disorder could not be tested for association, as none of the high school students reported having any medically diagnosed sleep disorder; therefore, chi-square value, test value, and p-value were not applicable (N/A)**, Do you have any habits of drinking coffee in the evening or before bedtime, Do you have any habits of drinking caffeinated drinks in the evening or before bedtime, Do you have any electronic device, sleep duration at night, Type of your family and Total number of children in your family were not found any significant association at $p<0.05$ level with pre-test attitude regarding Sleep hygiene among high school students .

Hence, the findings rejected the research hypothesis.

CHAPTER-V
DISCUSSION

Title of the Study: "A study to assess the effectiveness of educational program on the level of knowledge and attitude regarding sleep hygiene of students among the high school students in selected high school , Guwahati, Assam."

In order to achieve the objectives of the study, pre-experimental design was adopted.

In present study, 110 High School Student were selected as sample by Non probability convenient sampling technique.

5.1 : MAJOR FINDINGS OF THE STUDY WERE AS FOLLOWS_

5.1.1 : Demographic variables of the participants-

- Majority 64 (58.2%) of the High School Student belong to the age group of 14-15 years.
- Half i.e. 55(50%) of the High School Student were Male and 55(50%) of the High School Student

were Female.

- Majority i.e. 65 (59.1%) of the High School Student were Muslim.
- Majority i.e. 46 (41.8%) Father of the High School Student was Daily wager.
- Majority i.e.57 (51.8%) Mother of the High School Student was Unemployed.
- Majority i.e.110 (11%) of the High School Student did not have any medically diagnosed sleep disorder.
- Majority i.e. 84 (76.4%) of the High School Student did not have any habit of drinking coffee in the evening or before bedtime.
- Majority i.e. 97 (88.2%) of the High School Student did not have any habit of drinking caffeinated drinks in the evening or before bedtime.
- Majority i.e. 91 (83.7%) of the High School Student have electronic device.
- Majority i.e. 64 (58.1%) of the High School Student have 6-8 hours sleep duration at night.
- Majority i.e.86 (78.2%) of the High School Student belongs to a Nuclear family.
- Majority i.e. 46 (41.8%) of the High School Students have total 2 children in their family.

5.1.2 DISCUSSION OF THE FINDINGS ON THE BASIS OF THE OBJECTIVES OF THE RESEARCH STUDY:

5.1.2.1 : To assess the pre-test level of knowledge regarding sleep hygiene of students among the high school students in selected high school, Guwahati , Assam .

The present study was done to assess the pre-test level of knowledge regarding sleep hygiene of students among the high school students in selected high school, Guwahati , Assam .

Results of the present study revealed that in pretest majority **59(53.6%)** had **Inadequate** knowledge, **41(37.3%)** had **moderate** knowledge and **10(9.1%)** had **adequate** knowledge.

This study is supported by a study conducted by **Flavia Cortesi, Flavia Giannotti, Teresa Sebastiani, Oliviero Bruni, Salvatore Ottaviano (2004)** conducted a study to evaluate knowledge about sleep and the effect of a sleep educational program on a group of Italian adolescents. The School Sleep Habits Survey was completed by 540 students, aged 17 to 19 years, who were attending three secondary public schools. Students were randomly assigned to the control and intervention group. Only the latter participated in the educational program. A pre-test evaluated baseline knowledge about sleep, a post-test measured the gain in knowledge after the course, and a 3-month follow-up test evaluated long-term retention of information. Improvement in knowledge was measured by increase in correct answers and comparisons of means between baseline and follow-up mean scores. Control group completed only baseline and 3-month follow-up tests. Data were analyzed using repeated measures analysis of variance, Cochran Q, and Mc Nemar tests. **Results show that unhealthy sleeping habits in 34% of students associated with high level of subjective sleepiness, increased vulnerability to injuries, and poor daytime functioning. Pre-test score showed a value of 4.2, post-test of 8.6 and 3-month follow-up of 6.7. Low baseline knowledge about sleep,** an increase in knowledge, with an average of 50% gain in the percentage of correct answers immediately after the course, with a good long-term retention of information were found for the students who received the intervention as compared with control group**.** This study concludes that sleep educational programs for secondary students are recommended to improve information about sleep. [17]

5.1.2.2 : To assess the pre-test attitude regarding sleep hygiene of students among the

high school students in selected high school, Guwahati , Assam .

The present study was done to assess the pre-test attitude regarding sleep hygiene of students among the high school students in selected high school, Guwahati , Assam .

Results of the present study revealed that in pretest maximum of high school students **63(57.3%)** had **negative** attitude and **47(42.7%)** had positive **attitude.**

This study is supported by a study conducted by **Caitlin R Semsarian, Gabrielle Rigney, Peter A Cistulli, Yu Sun Bin(2021)** conducted a study to evaluate the impact of an online 10-week course on undergraduate students' sleep knowledge, attitude, and behaviors at 6-month follow-up. Data were collected via baseline course surveys (August–September 2020) and follow-up surveys distributed via email (February–March 2021). n = 212 students completed baseline surveys and n = 75 (35%) completed follow-up. Students retained to follow-up possessed higher baseline sleep knowledge and received higher course grades. At the 6-month follow-up, sleep knowledge had increased (mean score out of 5: 3.0 vs. 4.2, $p < 0.001$). At baseline, 85% of students aimed to increase their sleep knowledge and 83% aimed to improve their sleep. At follow-up, 91% reported being more knowledgeable and 37% reported improved sleep. **A novel Stages of Change item revealed that 53% of students' attitudes towards their sleep behaviors had changed from baseline**. There was a reduction in sleep latency at follow-up (mean 33.3 vs. 25.6 min, $p = 0.015$), but no change in the total Pittsburgh Sleep Quality Index score. This study concludes that completion of an online course led to increased sleep and circadian knowledge and changed sleep attitudes, with no meaningful change in sleep behaviors. Future interventions should consider components of behavioral change that go beyond the knowledge–attitudes–behavior continuum. [35]

5.1.2.3 : To assess the post- test level of knowledge regarding sleep hygiene of students among the high school students in selected high school, Guwahati, Assam.

The present study was done to assess the post- test level of knowledge regarding sleep hygiene of students among the high school students in selected high school, Guwahati, Assam.

Results of the present study revealed that in post test majority **76(69.1%)** had **adequate** knowledge and **34(30.9%)** had **moderate** knowledge regarding Sleep hygiene among high school students and 0 (0%) had inadequate knowledge.

A study conducted by **Alexandra Colt and Jo Marie Reilly (2019)** among high school students in Los Angeles to evaluate a sleep education intervention. The researchers used a pre-test and post-test design to assess students' knowledge regarding sleep and sleep hygiene. Pre- and post surveys measuring both sleep behaviors and knowledge, and a Patient Health Questionnaire-9 depression screening were administered to participants prior to and after the intervention. They used t tests and χ 2 tests to analyze knowledge and behavior change. Results shows that subjects improved in average sleep hours per night (**pre intervention 6.9 hours to post intervention 7.8 hours, P=.0134),** and average weekend night bedtime (11:36 pm to 10:54 pm, P=.0307). **Findings revealed that post-test knowledge scores were significantly higher than pre-test scores after the educational intervention, showing improvement in students' knowledge about healthy sleep practices.**[39]

5.1.2.4 : To assess the post-test attitude regarding sleep hygiene of students among the high school students in selected high school, Guwahati , Assam .

The present study was done to assess post-test attitude regarding sleep hygiene of students among the high school students in selected high school, Guwahati , Assam .

Results of the present study revealed that as in post test all 110(100%) of high school students had positive attitude regarding Sleep hygiene.

This study is contradicted by a study conducted by **Wei Zhong, Jie Ding, Xiaoyi Cai, Jun Yan, Fengshu Zhu(2025) c**onducted a study to explore the Knowledge, Attitude, and Practice (KAP) of Chinese high school students regarding sleep disorders, in order to provide insights for targeted educational interventions. Study was conducted at six schools between November 10, 2023, and December 20, 2023. Demographic characteristics, the Self-Rating Scale of Sleep (SRSS), and the KAP scores of the participants were collected using a self-administered questionnaire. **Results shows that the mean scores for the SRSS were 23.51 ± 6.18 (possible range: 10-50), for knowledge were 10.00 ± 4.84 (possible range: 0-18), for attitude were 35.53 ± 4.23 (possible range:9-45), and for practice were 28.85 ± 6.29 (possible range:8-40), respectively.** The structural equation modeling (SEM) model demonstrated that sleep quality directly influenced knowledge (beta = - 0.154 , $p < 0.001$) , Knowledge also had a direct effect on attitude (beta = - 0.169 $p < 0.001$) , and practice ($\beta = - 0.356$, $p < 0.001$) .This study concludes about sleep disorders among Chinese high school students, which could hinder their ability to manage these issues effectively. By focusing on this unique population under substantial academic pressure, the findings underscore the urgent need for tailored educational programs to promote better sleep habits and overall well-being. Educational interventions that enhance knowledge about sleep disorders should be implemented in high school curricula to bridge these gaps and improve sleep-related outcomes. [34]

5.1.2.5 : To evaluate the effectiveness of educational program by comparing the pre test and post test scores of knowledge and attitude regarding sleep hygiene of students among the high school students in selected high school, Guwahati, Assam.

The present study was done to evaluate the effectiveness of educational program by comparing the pre test and post test scores of knowledge and attitude regarding sleep hygiene
of students among the high school students in selected high school, Guwahati, Assam.

Present study revealed that results regarding knowledge showed that mean **post-test knowledge score was 13.10±2.50 higher than mean pre-test knowledge score 7.40±3.09 with mean difference of 5.69** and obtained (t value=15.40, df=109, p=0.001) was found statistically highly significant at $p<0.05$ level.

Results regarding attitude showed that mean post-test attitude score was 6.20±3.13 higher than mean pre-test attitude score 1.59±2.39 with mean difference of 4.60 and obtained (t value=15.28, df=109, p=0.001) was found statistically highly significant at $p<0.05$ level.

Findings indicate that educational program was effective in improving the Knowledge and attitude on Sleep hygiene among high school students.

This study is supported by a study conducted by **Dietrich, Shellene K.; Francis-Jimenez, Coleen M.; Knibbs, Melida Delcina; Umali, Ismael L.; Truglio-Londrigan, Marie(2016)** conducted a study To identify, appraise and synthesize the best available evidence on the effectiveness of sleep education programs in improving sleep hygiene knowledge, sleep hygiene behavior (Attitude) and/or sleep quality versus traditional strategies. Quantitative papers were assessed by two reviewers using critical appraisal instruments from the Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instrument (JBI-MASTARI). Data were extracted using the JBI-MASTARI data extraction tool**. The results show that two studies reported outcomes on sleep hygiene knowledge; one showing a statistically significant improvement (P = 0.025) and the other reported no difference (test of significance not provided). Two studies reported on sleep hygiene behavior; one showing no difference (P > 0.05) and the other reporting a statistically significant improvement (P = 0.0001). Four studies reported on sleep quality; three reporting no difference (P > 0.05) and the other**

reporting a statistically significant improvement (P = 0.017). This study reviewed article identified insufficient evidence to determine the effectiveness of sleep education on sleep hygiene knowledge, sleep hygiene behavior (Attitude) or sleep quality in this population. [27]

5.1.2.6 : To find out correlation between pre-test scores of knowledge and attitude regarding sleep hygiene of students among the high school students in selected high school, Guwahati, Assam.

The present study was done to find out correlation between pre-test scores of knowledge and attitude regarding sleep hygiene of students among the high school students in selected high school, Guwahati, Assam.

Present study revealed that the correlation between pretest scores of knowledge and attitude on Sleep hygiene among high school students which was measured by Karl Pearson correlation formula. Result revealed that (r=0.106, p=0.269) indicate weak positive correlation pretest scores of knowledge and attitude on Sleep hygiene among high school students and was found to be statistically non significant.

This study is contradicted by a study conducted by **Wei Zhong, Jie Ding, Xiaoyi Cai, Jun Yan, Fengshu Zhu(2025) c**onducted a study to explore the Knowledge, Attitude, and Practice (KAP) of Chinese high school students regarding sleep disorders, in order to provide insights for targeted educational interventions. Study was conducted at six schools between November 10, 2023, and December 20, 2023. Demographic characteristics, the Self-Rating Scale of Sleep (SRSS), and the KAP scores of the participants were collected using a self-administered questionnaire. Results shows that the mean scores for the SRSS were 23.51 ± 6.18 (possible range: 10-50), for knowledge were 10.00 ± 4.84 (possible range: 0-18), for attitude were 35.53 ± 4.23 (possible range:9-45), and for practice were 28.85 ± 6.29 (possible range:8-40), respectively. The structural equation modeling (SEM) model demonstrated that sleep quality directly influenced knowledge (beta = - 0.154 , $p < 0.001$) , **Knowledge also had a direct effect on attitude** (beta = - 0.169 $p < 0.001$) , and practice ($\beta = -0.356$, $p < 0.001$)The study found **a significant positive correlation between knowledge and attitude scores. Students with higher knowledge had better attitudes toward sleep health ($\beta = 0.216$, $p < 0.001$).** This indicates that increased knowledge was associated with a more positive attitude regarding healthy sleep practices among students. The findings support the present study objective that pre-test knowledge and attitude regarding sleep hygiene are positively correlated among high school students. [34]

5.1.2.7 : To find out the association between pre-test scores of knowledge with selected socio-demographic variables.

The present study was done to find out the association between pre-test scores of knowledge and attitude with selected socio-demographic variables.

depicts the association between pre-test knowledge regarding Sleep hygiene among high school students with their selected socio-demographic variables which was tested by using chi-square test. Result revealed that, socio-demographic variables such as Age of Participant (in years), Gender, Religion , Occupation of father, Occupation of mother, Do you have any medically diagnosed of sleep disorder , Do you have any habits of drinking coffee in the evening or before bedtime, Do you have any habits of drinking caffeinated drinks in the evening or before bedtime, Do you have any electronic device, Your sleep duration at night, Type of your family and Total number of children in your family were not found any significant association at $p<0.05$ level with pre-test knowledge regarding Sleep hygiene among high school students .

This study is contradicted by a study conducted by **Wei Zhong, Jie Ding, Xiaoyi Cai, Jun Yan, Fengshu Zhu(2025) c**onducted a study to explore the Knowledge, Attitude, and Practice (KAP) of Chinese high school students regarding sleep disorders, in order to provide insights for targeted educational interventions. Study was conducted at six schools between November 10, 2023, and December 20, 2023. Demographic characteristics, the Self-Rating Scale of Sleep (SRSS), and the KAP scores of the participants were collected using a self-administered questionnaire. The study examined the association of baseline (pre-test) knowledge and attitude scores with socio-demographic variables such as gender, age, residence, school type, and academic ranking. **The findings showed that knowledge scores were significantly associated with age, school level, and residence (p < 0.05)**. This indicated that socio-demographic factors had a significant influence on students' pre-test knowledge and attitude regarding sleep hygiene. [34]

5.1.2.7: To find out the association between pre-test scores of attitude with selected socio-demographic variables.

The present study was done to find out the association between pre-test scores of knowledge and attitude with selected socio-demographic variables.

Present study revealed that the association between pre-test attitude regarding Sleep hygiene among high school students with their selected socio-demographic variables which was tested by using chi-square test. Result revealed that sleep duration at night was found significant association with pre-test attitude regarding Sleep hygiene among high school students. But socio-demographic variables such as Age of Participant (in years), Gender, Religion , Occupation of father , Occupation of mother, Do you have any medically diagnosed of sleep disorder, Do you have any habits of drinking coffee in the evening or before bedtime, Do you have any habits of drinking caffeinated drinks in the evening or before bedtime, Do you have any electronic device, Type of your family and Total number of children in your family were not found any significant association at $p<0.05$ level with pre-test attitude regarding Sleep hygiene among high school students .

This study is contradicted by a study conducted by **Wei Zhong, Jie Ding, Xiaoyi Cai, Jun Yan, Fengshu Zhu(2025) c**onducted a study to explore the Knowledge, Attitude, and Practice (KAP) of Chinese high school students regarding sleep disorders, in order to provide insights for targeted educational interventions. Study was conducted at six schools between November 10, 2023, and December 20, 2023. Demographic characteristics, the Self-Rating Scale of Sleep (SRSS), and the KAP scores of the participants were collected using a self-administered questionnaire. The study examined the association of baseline (pre-test) knowledge and attitude scores with socio-demographic variables such as gender, age, residence, school type, and academic ranking. **The findings shows that attitude scores were significantly associated with gender, school level, and residence (p < 0.05)**. This indicated that socio-demographic factors had a significant influence on students' pre-test knowledge and attitude regarding sleep hygiene. [34]

CHAPTER- VI

SUMMARY, IMPLICATION, LIMITATION, RECOMMENDATION AND CONCLUSION:

This chapter deals with summary, major findings, implication of the study in the field of nursing education, nursing administration, nursing practice and nursing research. The limitations of the study have been stated and the recommendation for future research in different aspects has also been presented in this chapter.

6.1 SUMMARY:

The present study was done to assess the effectiveness of educational program on the level of knowledge and attitude regarding sleep hygiene of students among the high school students in selected high school , Guwahati, Assam.

6.1.3 SUMMARY OF THE FINDINGS:

6.1.3.1 Significant Findings of the Study

- Majority 64 (58.2%) of the High School Student belong to the age group of 14-15 years.
- Half i.e. 55(50%) of the High School Student were Male and 55(50%) of the High School Student were Female.
- Majority i.e. 65 (59.1%) of the High School Student were Muslim.
- Majority i.e. 46 (41.8%) Father of the High School Student was Daily wager.
- Majority i.e.57 (51.8%) Mother of the High School Student was Unemployed.
- Majority i.e.110 (11%) of the High School Student did not have any medically diagnosed sleep disorder.
- Majority i.e. 84 (76.4%) of the High School Student did not have any habit of drinking coffee in the evening or before bedtime.
- Majority i.e. 97 (88.2%) of the High School Student did not have any habit of drinking caffeinated drinks in the evening or before bedtime.
- Majority i.e. 91 (83.7%) of the High School Student have electronic device.
- Majority i.e. 64 (58.1%) of the High School Student have 6-8 hours sleep duration at night.
- Majority i.e.86 (78.2%) of the High School Student belongs to a Nuclear family.
- Majority i.e. 46 (41.8%) of the High School Students have total 2 children in their family.
- The present study showed that in pretest among 110 High School Students majority 59(53.6%) had inadequate knowledge, 41(37.3%) had moderate knowledge and 10(9.1%) had adequate knowledge where as in posttest majority 76(69.1%) had adequate knowledge and 34(30.9%) had moderate knowledge regarding Sleep hygiene among high school students.
- The present study showed that mean post-test knowledge score was **13.10±2.50** higher than mean pre-test knowledge score **7.40±3.09** with mean difference of **5.69** and obtained **(t value=15.40, df =109, p=0.001)** was found statistically highly significant at **p <0.05** level. Findings indicate that educational program was effective in improving the Knowledge on Sleep hygiene among high school students.
- The present study reveals that in pretest maximum of high school students 63(57.3%) had negative attitude and 47(42.7%) had positive attitude where as in posttest all 110(100%) of high school students had positive attitude regarding Sleep hygiene.
- The present study showed that mean post-test attitude score was 6.20±3.13 higher than mean pre-test attitude score 1.59±2.39 with mean difference of 4.60 and obtained (t value=15.28, df=109, p=0.001) was found statistically highly significant at p<0.05 level.

Findings indicate that educational program was effective in improving the attitude on Sleep hygiene among high school students.

- The present study was conducted to determine the correlation between pre test scores of Knowledge and attitude on Sleep hygiene among high school students which was measured by Karl Pearson correlation formula. Result revealed that (r=0.081, p=0.042) indicate weak positive correlation pretest scores of Knowledge and attitude on Sleep hygiene among high school students and was found to be statistically non significant.

- The present study was conducted to determine the association between pre-test knowledge regarding Sleep hygiene among high school students with their selected socio-demographic variables which was tested by using chi-square test. Result revealed that, socio-demographic variables such as Age of Participant (in years), Gender, Religion , Occupation of father, Occupation of mother, Do you have any medically diagnosed of sleep disorder (**The variable history of medically diagnosed sleep disorder could not be tested for association, as none of the high school students reported having any medically diagnosed sleep disorder; therefore, chi-square value, test value, and p-value were not applicable (N/A)** , Do you have any habits of drinking coffee in the evening or before bedtime, Do you have any habits of drinking caffeinated drinks in the evening or before bedtime, Do you have any electronic device, Your sleep duration at night, Type of your family and Total number of children in your family were not found any significant association at $p<0.05$ level with pre-test knowledge regarding Sleep hygiene among high school students.
- The present study was conducted to determine the association between pre-test attitude regarding Sleep hygiene among high school students with their selected socio-demographic variables which was tested by using chi-square test. Result revealed that socio-demographic variables such as Age of Participant (in years), Gender, Religion , Occupation of father , Occupation of mother, Do you have any medically diagnosed of sleep disorder (**The variable history of medically diagnosed sleep disorder could not be tested for association, as none of the high school students reported having any medically diagnosed sleep disorder; therefore, chi-square value, test value, and p-value were not applicable (N/A)**, Do you have any habits of drinking coffee in the evening or before bedtime, Do you have any habits of drinking caffeinated drinks in the evening or before bedtime, Do you have any electronic device, sleep duration at night, Type of your family and Total number of children in your family were not found any significant association at $p<0.05$ level with pre-test attitude regarding Sleep hygiene among high school students .

6.2 NURSING IMPLICATION OF THE STUDY:

6.2: Nursing Practice

- Nurses can use the findings to enhance their patient's education.
- Nurses can communicate to address the specific knowledge gaps related to Sleep Hygiene among the High School Students and their families.
- Nurses can use the findings as baseline data for future studies involving larger samples and different settings to enhance the wider applicability of results.

6.2.2 : Nursing Education

The nurse educator should be adequately trained to address the health issues related to Sleep Deprivation.

6.2.3 : Nursing Administration

The nurse administrator can encourage the nurses to provide health teaching on Sleep hygiene.

6.2.4 : Nursing Research

The findings of the study can be disseminated through conferences, seminars and by publishing in journals and websites.

The findings of the study motivate the nurse researchers to conduct more studies related to Sleep hygiene.

6.3 : STRENGTH:

The strength of this study was the use of Educational Program which has provided a comprehensive knowledge regarding Sleep Hygiene and made it more effective.

6.4 : LIMITATIONS:

The study's results cannot be broadly applied because of the limited sample size.

6.5 : RECOMMENDATIONS:

- The current investigation can be done in different setting.
- The current investigation can be performed in large sample of high school student.

6.6 : CONCLUSION:

The main conclusion draw from the present study was that most of the High School Student had inadequate knowledge and negative attitude regarding Sleep Hygiene. After Educational Program, it was found that they had significantly improved in level of knowledge and attitude regarding Sleep Hygiene.

REFERRENCES

1. National Library of Medicine (US). Healthy sleep [Internet]. MedlinePlus; 2023 [cited 2026 Feb 8]. Available from: https://medlineplus.gov/healthysleep.html
2. National Library of Medicine (US). Sleep [Internet]. Online Etymology Dictionary; c2001–2026 [cited 2026 Feb 8]. Available from: https://www.etymonline.com/word/sleep
3. Irish LA, Kline CE, et al. The role of sleep hygiene in promoting public health: a review of empirical evidence [Internet]. Sleep Med Rev. 2014 Oct 16;22:23–36 [cited 2026 Feb 8]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4400203/
4. Upadhyay A. 1 in 5 adolescents in Delhi are clinically sleep-deprived. [Internet]. The Indian Express (New Delhi); 2025 Jun 6 [cited 2026 Feb 8]. Available from: https://indianexpress.com/article/cities/delhi/1-in-5-adolescents-delhi-clinically-sleep-deprived-heres-what-study-shows-10052326/
5. Chen Z, Li R, Liu Y, Lian Q. Sufficient sleep and its contributing factors among high school students during the COVID-19 pandemic: results from adolescent behaviors and experiences survey [Internet]. Front Public Health. 2024 Aug 16;12:1408746 [cited 2026 Feb 8]. Available from: https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2024.1408746/full
6. Gridhar S. Sleep quality among adolescents: a review of prevalence, factors, and interventions [Internet]. Int J Dev Res. 2024 Sep 30;14:66615–66617 [cited 2026 Feb 8]. Available from: https://www.journalijdr.com/sleep-quality-among-adolescents-review-prevalence-factors-and-interventions (journalijdr.co
7. Chattu VK, Manzar MD, Kumary S, Burman D, Spence DW, Pandi-Perumal SR. The global problem of insufficient sleep and its serious public health implications [Internet]. Healthcare (Basel). 2018 Dec 20;7(1):1 [cited 2026 Feb 8]. Available from: https://www.mdpi.com/2227-9032/7/1/1 (PMCID: PMC6473877)
8. Phillips P, Francis B, Bull C, et al. Oxford advanced learner's dictionary of current English. 8th ed. Oxford: Oxford University Press; 2010. p. 486, 734, 1104, 1537
9. Sharma SK. Nursing research and statistics. 4th ed. New Delhi: Elsevier; 2023. p. 98, 112, 30–55, 201, 227, 236–237, 393, 406.
10. Venkatesan L. Nursing research and statistics. 1st ed. Delhi: CBS Publishers & Distributors Pvt. Ltd.; 2024. p. 32, 132, 223, 225, 227, 252, 289, 299.
11. Abothu P. A descriptive study to assess the knowledge of sleep hygiene among first-year B.Sc. nursing students in a selected nursing college in Eluru, A.P., with a view to developing an information

pamphlet. Int J Paediatr Geriatr. 2025;8(2):09–14. doi:10.33545/26643685.2025.v8.i2a.263.
12. Zhang Y, Li X, Wang H, et al. Knowledge, attitude, and practice toward sleep disorders among Chinese high school students. BMC Pediatrics. 2025;25(1):106.
13. Sun W, Pan R, Song X, Gu T, Ni Q, Gu Y. Knowledge, attitude, and practice toward sleep hygiene and cardiovascular health: a cross-sectional survey among healthcare workers. Front Public Health. 2024;12:1415849.
14. Grade I, Esteves AM, Lira FS, Padilha CS, Stieler E, Brandt V, et al. Knowledge about sleep, sleep hygiene, and sleep behaviors of Paralympic athletes. Journal of Sport Rehabilitation. 2023. doi:10.1123/jsr.2023-0374.
15. Andrijević I, Simić S, Stanojević Č, Golubović B, Milutinović D. Sleep quality in relation to sleep hygiene knowledge and practice, chronotype and lifestyle behaviour among healthcare students. Medicinski pregled. 2018;71(Suppl 1):17–24.
16. Saintila J, Javier-Aliaga D, Gálvez-Díaz N del C, Barreto-Espinoza LA, Buenaño-Cervera NA, Calizaya-Milla YE. Association of sleep hygiene knowledge and physical activity with sleep quality in nursing and medical students: a cross-sectional study. PLoS One. 2024;19(2):e0298795. Available from: https://pubmed.ncbi.nlm.nih.gov/401819 .
17. Cortesi F, Giannotti F, Sebastiani T, Bruni O, Ottaviano S. Knowledge of sleep in Italian high school students: pilot-test of a school-based sleep educational program. Journal of Adolescent Health. 2004;34(4):344-351.
18. Singh R, Roy M, Alvi A, et al. Sleep hygiene practices and its impact on sleep quality and mood. J Family Med Prim Care. 2025 Jul 21;14(7):2966–2973. doi:10.4103/jfmpc.jfmpc_133_25.
19. Kanyadi SR, Shindhe VM, Kamate RP, Javali SB. Sleep hygiene practices and sleep quality among undergraduate medical students: a cross-sectional study. National Journal of Community Medicine. 2025;16(9):879–886. doi:10.55489/njcm.160920255548..
20. Gawade ND, Isaac DN, Khadkikar RM, Isaac CD. A study of sleep hygiene practices and quality of sleep in health professional students. MGM Journal of Medical Sciences. 2024;11(4):616–622. doi:10.4103/mgmj.mgmj_206_24.
21. Alanzi EM, Alanazi AMM, Albuhairy AH, Alanazi AAA. Sleep hygiene practices and its impact on mental health and functional performance among adults in Tabuk City: a cross-sectional study. Cureus. 2023.
22. John B. Sleep duration and sleep hygiene practices in adolescents: age and gender differences. Nitte University Journal of Health Science. 2014;4(4):65–69.
23. Wolfson AR, Harkins E, Johnson M, Marco C. Effects of the Young Adolescent Sleep Smart Program on sleep hygiene practices, sleep health efficacy, and behavioral well-being. Sleep Health. 2015;1(3):197-204.
24. Illingworth G, Sharman R, Harvey C-J, Foster RG, Espie CA. The Teensleep study: the effectiveness of a school-based sleep education programme at improving early adolescent sleep. Sleep Med X. 2020;2:100011. doi:10.1016/j.sleepx.2019.100011.
25. Chung KF, Lee CT, Yeung WF, Chan MS, Chung E WY, Lin WL. Sleep hygiene education as a treatment of insomnia: a systematic review and meta-analysis. Family Practice. 2018;35(4):365–375.
26. Yazdi Z, Jalilolghadr S, Tootoonchian F. Effect of a sleep hygiene education program on sleep problems in female nurses on shift work. Journal of Sleep Sciences. 2017;2(1-2):28-33.
27. Dietrich SK, et al. Effectiveness of sleep education programs to improve sleep hygiene and/or sleep

quality in college students: a systematic review. JBI Database System Rev Implement Rep. 2016 Sep.
28. Johnson DD, Roberson A. The evaluation of the effectiveness of relaxation training and sleep hygiene education for insomnia of depressed patients. Journal of Doctoral Nursing Practice. 2013;6(1):39.
29. Choudary A, Nair HM, Jaisingh J, Joseph L. Effectiveness of sleep hygiene programme on knowledge and practice regarding sleep hygiene among selected institutionalized older adults. J Popul Ther Clin Pharmacol. 2023;30(18):783-785. doi:10.53555/jptcp.v30i18.3169.
30. Manik MI, Sreevani R. Effectiveness of structured teaching programme regarding sleep hygiene and sleep disorders on knowledge of students in a selected pre-university college at Bengaluru. Open J Psychiatry Allied Sci. 2016;7(2):137-42. doi:10.5958/2394-2061.2016.00025.2. Available from: researchgate.net [cited 2026 Jun 4].
31. Kothari CR. Research methodology: methods and techniques. 2nd ed. New Delhi: New Age International Publishers; 2004.
32. Santoso A. Rumus Slovin: Panacea Masalah Ukuran Sampel? Suksma: Jurnal Psikologi Universitas Sanata Dharma. 2023;4(2):24-43. doi:10.24071/suksma.v4i2.6434. Available from: https://e-journal.usd.ac.id/index.php/suksma/article/view/6434
33. Sharma SK. Nursing research and statistics. 4th ed. New Delhi: Elsevier; 2023. p. 30-55, 98, 112, 201, 227, 236-37, 393, 406.
34. Zhong W, Ding J, Cai X, Yan J, Zhu F. Knowledge, attitude, and practice towards sleep disorders among high school students: a cross-sectional study. BMC Pediatr. 2025;25(1):106. doi:10.1186/s12887-025-05440-y. Available from: bmcpediatr.biomedcentral.com [cited 2026 Jun 4].
35. Semsarian CR, Rigney G, Cistulli PA, Bin YS. Impact of an online sleep and circadian education program on university students' sleep knowledge, attitudes, and behaviours. Int J Environ Res Public Health. 2021;18(19):10180. doi:10.3390/ijerph181910180. Available from: mdpi.com [cited 2026 Jun 4].
36. Jani S, Parhiz A, Aminzadeh A, Javanmardi K, Jafarinezhad F. Worldwide prevalence of poor sleep quality in adolescents aged 10-19 years: a systematic review and meta-analysis. Iran J Child Neurol. 2026;20(2):1-11.
37. Dinakar C, Galagali P, Kumar AS, Abhishekh HA. Adolescent sleep problems and behavior: a school survey. Indian J Pediatr. 2014;81(7):726-27.
38. Jaiswal A. One in five Delhi teens clinically sleep-deprived; 60% show signs of depression, says study. Times of India [Internet]. 2025 Jun 4 [cited 2026 Jun 4]. Available from: https://timesofindia.indiatimes.com/city/delhi/one-in-five-adolescents-in-delhi-sleep-deprived/articleshow/121604347.cms
39. Wolfson AR, Harkins E, Johnson M, Marco C. Effects of the Young Adolescent Sleep Smart Program on sleep hygiene practices, sleep health efficacy, and behavioral well-being. Sleep Health. 2015;1(3):197-204.