

ASSESSMENT OF SLEEP PATTERN, SLEEP DURATION, AND SLEEP QUALITY AMONG THE STUDENT POPULATION: A QUESTIONNAIRE BASED CROSS-SECTIONAL STUDY

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Abstract

In this cross-sectional study, 454 students' sleep duration, patterns, and quality were evaluated using a structured questionnaire. 59.69% of participants reported poor sleep quality, whereas the majority showed good sleep patterns with mild risk. 5.29% of people used sleep aids. The results highlight the significance of consistent sleep schedules, better sleep quality, fewer factors that interfere with sleep, and knowledge of healthy sleep practices.

Keywords: Sleep Pattern; Sleep Duration; Sleep Quality; Students; Sleep Hygiene; Daytime Sleepiness; Academic Stress; Sleep Habits; Sleep Medication; Questionnaire-Based Cross-Sectional Study.

Introduction

Sleep is important for preserving mental and physical health, cognitive function, and general quality of life. For students, getting enough sleep is very important because it enhances learning, memory, focus, attention, emotional stability, and academic performance. However, students' sleep can be adversely affected by their academic workload, tests, assignments, stress, electronic device use, caffeine consumption, naps during the day, and irregular daily routines. While sleep duration refers to the overall amount of time spent sleeping, sleep pattern describes the regularity and timing of sleeping and waking. A person's ability to fall asleep, stay asleep, wake up feeling rejuvenated, and function during the day are all indicators of the quality of their sleep. Environmental elements that affect sleep include light, noise, and comfort.

Background of study

Sleep is a most important physiological function that promotes memory, learning, emotional stability, mental and physical health, and cognitive function. For students, getting enough and high-quality sleep is especially crucial because academic tasks demand focus, attention, problem-solving skills, and efficient learning. Regular bedtimes and wake-up times, sufficient sleep duration, and high-quality sleep are all components of a healthy sleep pattern. However, academic workload, tests, assignments, stress, electronic device use, social activities, caffeine consumption, and naps during the day can all cause students to have irregular sleep. Daytime fatigue, drowsiness, poor concentration, memory loss, mood swings, and poor academic performance can all be caused by inadequate or disrupted sleep. Higher education-related lifestyle changes, like living in dorms, travelling, having erratic class schedules, and becoming more independent, may also have an impact on sleeping patterns. Consequently, evaluating sleep habits. In order to identify unhealthy sleep behavioural patterns, it is essential to evaluate students' sleep patterns, duration, and quality. These variables can be evaluated and common lifestyle and academic factors linked to sleep issues can be found using a questionnaire-based cross-sectional study. The results might raise awareness of sleep health issues and motivate students to establish regular, healthy sleeping patterns.

4. Review of literature:

4.1 Ling-Ling Tsai et.al A 7-day sleep log was used in a study involving 237 college students between the ages of 18 and 24 to investigate the impact of gender and academic grade on daily sleep patterns. The results showed notable gender differences in several sleep-related traits. Compared to male students, female students typically had earlier bedtimes and wake-up times, longer sleep latency, more frequent awakenings, and lower-quality sleep. Males showed a stronger correlation between sleep quality and factors like rising time, bedtime, and sleep efficiency. Most grade-related disparities were found between weekdays and weekends. While seniors exhibited longer sleep latency, freshmen slept for shorter periods of time and woke up earlier on weekdays. The study underlines the necessity of sleep-awareness interventions and reveals significant sleep issues among college students.

4.2 Xianchen Liu et.al A study conducted among 3,030 adults in Japan examined sleep duration, sleep problems, and excessive daytime sleepiness. The findings showed that 29% of participants slept less than six hours per night, while 23% reported insufficient sleep. Symptoms of insomnia were observed in 21% of participants, and 15% experienced excessive daytime sleepiness. Short sleep duration, insomnia symptoms, and subjective insufficient sleep were significantly associated with excessive daytime sleepiness. Younger adults were particularly likely to report short sleep duration and daytime sleepiness, whereas insomnia was more common among older adults. Multiple logistic regression identified short sleep duration as the strongest predictor of excessive daytime sleepiness. The study highlights the common occurrence of inadequate sleep and daytime sleepiness among adults.

4.3 YOUNG MAN PARK et.al We examined how age and gender affected the regular sleep-wake cycle in 2252 randomly chosen Shimonoseki, Japan residents. The subjects were split up into 21 age groups, each with an equal number of males and females. From elementary school thru adolescence, sleep duration decreased and bedtime was postponed. After that, as people grew older, they went to bed earlier and slept longer. After 50 and 70 years of age, respectively, there was a significant increase in the number of awakenings and the duration of daytime naps. In Japan, gender disparities were thought to be caused by women's social and domestic traditions.

4.4 Kyuja Kim MD et.al A population-based study of 3,030 adults in Japan examined the prevalence of insomnia and its contributing factors. According to the study, 21.4% of participants reported having sleeplessness in the month prior. The most frequent complaint was trouble staying asleep (15.0%), which was followed by trouble falling asleep (8.3%) and waking up early (8.0%). The results showed that older age, unemployment, irregular exercise, poor perceived health, psychological stress, and insufficient stress management were all strongly linked to insomnia. The researchers concluded that the prevalence of insomnia in the general Japanese population is comparable to that documented in Western nations. The study also emphasised the significant role that lifestyle and psychosocial factors play in sleep disturbances.

4.5 G LIVINGSTON et.al The prevalence and contributing factors of sleep disturbances were examined in a long-term study of senior citizens 65 years of age and older in an inner London community. A validated semi-structured interview schedule was used to assess 705 participants in 1987–1988 and follow up with 524 in 1990. According to the study, 33% of participants had sleep disturbances at the beginning and 43% at the end. It was not linked to dementia or growing older, but it was strongly correlated with female sex, being single, living alone, disability, and depression. Crucially, among elderly people who were not initially depressed, sleep disturbance was found to be the best indicator of future depression. The results highlight the need for proper evaluation and treatment of insomnia rather than viewing it as an inevitable part of ageing.

5. Aim and objectives

Aim

To assess the sleep pattern, sleep duration, and sleep quality among the student population using a questionnaire-based cross-sectional study.

Objective

1. To assess the sleep patterns of students, including their usual bedtime, wake-up time, and regularity of sleep schedule.
2. To assess the sleep duration among students and identify students with inadequate or irregular sleeping hours.
3. To evaluate the sleep quality of students based on their perceived sleep quality, nighttime awakenings, difficulty falling asleep, and daytime sleepiness.
4. To identify factors influencing sleep patterns, including academic workload, stress, electronic-device use, caffeine consumption, daytime naps, and sleeping environment.

5. To assess the use of sleep medication or sleep aids among the student population.
6. To classify students according to their sleep-performance scores using the predefined questionnaire scoring system.
7. To provide awareness regarding healthy sleep practices and sleep hygiene based on the findings of the study.

6. Plan of Study:

The current study's objective is to use a prospective observational questionnaire to assess students' sleep cycles and sleep-related variables. The study will be conducted during a scheduled study period after obtaining the necessary ethical approval. Participants who fit the inclusion criteria will be added to the study after obtaining informed consent.

This study will assess key sleep-related metrics, including sleep duration, bedtime, wake-up time, sleep quality, sleeping environment, daytime sleepiness, academic stress, and other variables affecting sleep performance. The required information will be gathered using a structured data collection questionnaire. Each question will receive a predetermined score of five points based on sleep performance.

Preliminary literature search

- ❖ Review of literature
- ❖ Designing of study protocol
- ❖ Designing of sleep-cycle questionnaire
- ❖ Institutional Ethical Committee approval process
- ❖ Selection of study participants based on inclusion and exclusion criteria
- ❖ Obtaining informed consent
- ❖ Distribution of questionnaire to participants
- ❖ Collection of sleep-cycle and related information
- ❖ Scoring of each questionnaire (5 marks per question)
- ❖ Classification of participants based on sleep-performance scores
- ❖ Data entry in Microsoft Excel
- ❖ Data analysis
- ❖ Statistical analysis
- ❖ Preparation of observation tables, graphs and pie charts
- ❖ Results and discussion
- ❖ Conclusion

7. METHODOLOGY:

7.1 Study design: A questionnaire-based, cross-sectional observational study.

7.2 Study setting: The study will be conducted among students at a selected college.

7.3 Study population: Students who are willing to participate and meet the eligibility criteria.

7. 4. Study duration: Approximately **3–6 months**, including questionnaire preparation, data collection, analysis, and report preparation.

7.5 Sample size: A suitable number of students will be selected according to the available study population and feasibility. For a student project, **400-450 participants** may be considered if feasible.

7.6 Sampling method: Convenience sampling or simple random sampling may be used depending on the availability of students.

7.7 Data collection tool: A structured questionnaire will be used to collect information regarding:

- ❖ Demographic characteristics
- ❖ Usual sleep and wake-up time
- ❖ Total sleep duration
- ❖ Bedtime habits
- ❖ Night-time awakenings
- ❖ Daytime sleepiness
- ❖ Factors affecting sleep

- ❖ Use of sleep medication/sleep aids
- ❖ Perceived sleep quality

7.8 Inclusion criteria:

- ❖ Students willing to participate.
- ❖ Students who provide informed consent.
- ❖ Students able to understand and complete the questionnaire.
- ❖ Students within the predefined age range of the study.

7.9 Exclusion criteria:

- ❖ Students unwilling to participate.
- ❖ Incomplete questionnaires.
- ❖ Students unable to understand or complete the questionnaire.
- ❖ Students with conditions that make questionnaire completion difficult, if specified in the protocol.

7.10 Study procedure:

- ❖ The objectives of the study will be well-defined.
- ❖ To evaluate the participants', sleep cycles, a structured questionnaire will be created.
- ❖ The predetermined inclusion criteria will be used to select eligible students.
- ❖ The participants will receive an explanation of the study's purpose.
- ❖ The questionnaire will be used to collect data.
- ❖ The predetermined 5-mark scoring system will be used to score each questionnaire.
- ❖ Based on their overall scores, participants will be divided into four categories related to sleep performance.
- ❖ The information gathered will be input into Microsoft Excel.
- ❖ Frequency and percentage distributions will be used to present the results.
- ❖ Pie charts, bar graphs, and observation tables will be used to present the results.
- ❖ Sleep performance will be analysed in relation to factors like academic stress, sleeping environment, and sleeping hours.
- ❖ After interpreting the overall results, a conclusion about the study population's sleep cycle will be made.

7.11 Data analysis: The collected data will be imported into Excel and analysed using descriptive statistics. The results will be displayed as frequency, percentage, mean, and standard deviation where appropriate. Relationships between sleep quality and particular behavioural/demographic traits can be assessed using an appropriate statistical test.

7.12 Ethical considerations: It will be completely voluntary to participate. Informed consent will be obtained prior to any data collection. Personal information will be kept confidential, and participants will be free to withdraw from the study at any time.

7.13 Expected outcome: The study is expected to identify factors associated with inadequate or poor-quality sleep, average sleep duration, prevalence of poor sleep quality, and sleep patterns of students.

8. Result:

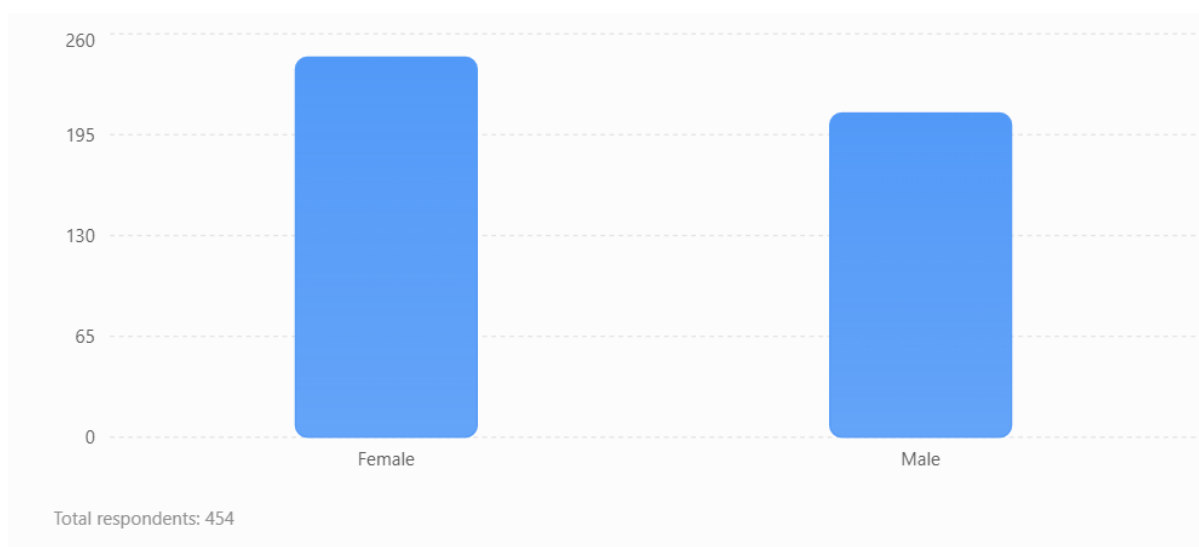
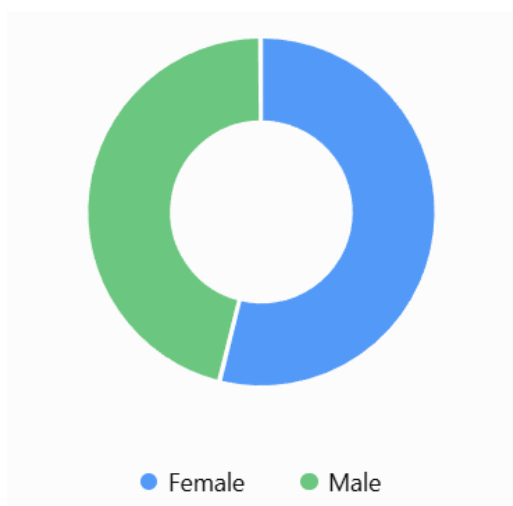
The questionnaire scoring system, which gave each question five marks and a maximum score of 100, was used to evaluate the percentage score-wise distribution among 454 valid respondents. The majority of respondents, 325 (71.74%), received scores between 51 and 75%, indicating a good sleep pattern with mild risk, according to the results. A correct sleep pattern with no risk

was attained by 115 respondents (25.39%) who scored between 76 and 100%. A fair sleep pattern with moderate risk was indicated by the 13 respondents (2.87%) who scored between 26 and 50%. None of the respondents fell into the high-risk or poor sleep pattern category with a score between 1 and 25%. Overall, the results show that while some participants may need to improve their sleep habits, the majority of respondents showed a good level of sleep performance.

Gender-wise Distribution

Gender-wise distribution refers to the distribution of study participants according to their reported gender, expressed as frequency and percentage.

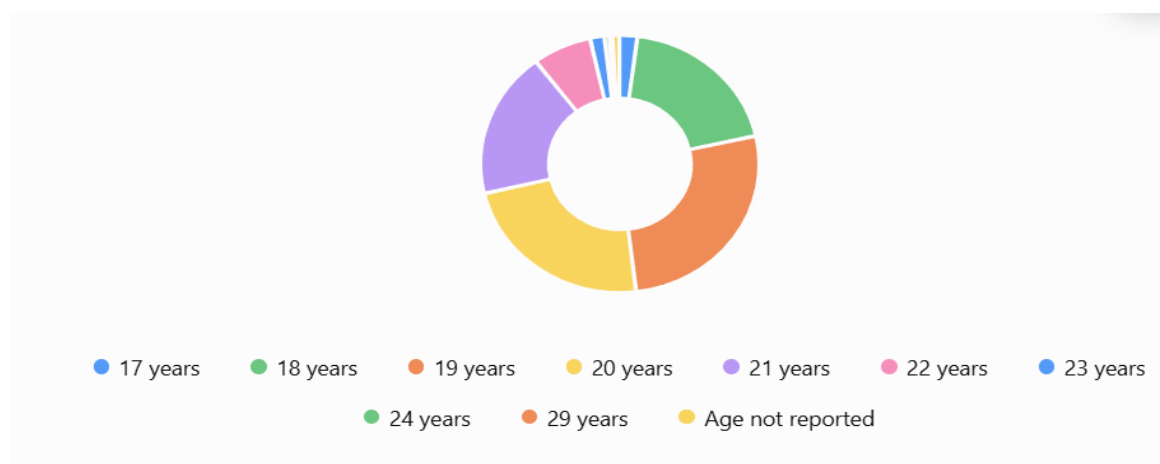
Gender	Frequency (n)	Percentage (%)
Female	245	53.96%
Male	209	46.04%
Total	454	100%

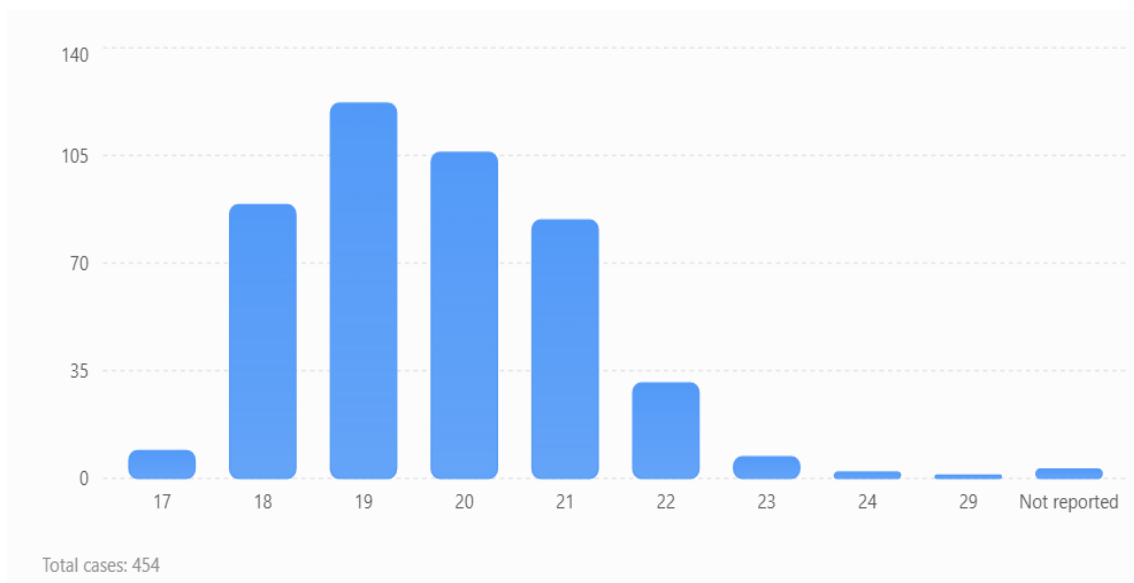


According to the distribution by gender, female students made up 245 (53.96%) of the respondents, while male students made up 209 (46.04%). As a result, a slightly higher percentage of the study population was female.

Age-wise Distribution: Age-wise distribution is the classification of study participants according to their age groups and presentation of the number (frequency) and proportion (percentage) of participants in each age group.

Age	Cases	Percentage
17 years	9	1.98%
18 years	89	19.60%
19 years	122	26.87%
20 years	106	23.35%
21 years	84	18.50%
22 years	31	6.83%
23 years	7	1.54%
24 years	2	0.44%
29 years	1	0.22%
Age not reported	3	0.66%
Total	454	100%



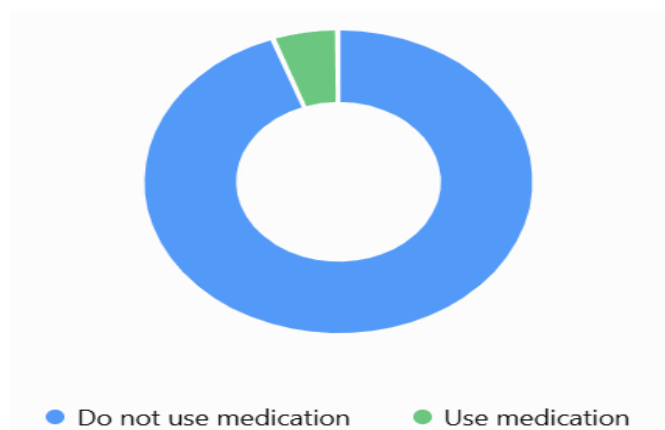


The age-wise distribution indicates that the majority of respondents were 19 years old (27.05%), followed by 20 years (23.50%) and 18 years (19.73%). Respondents aged 21 years constituted 18.63%, while smaller proportions were observed among 22–29-year-old participants. Overall, the study population was predominantly composed of students aged 18–21 years.

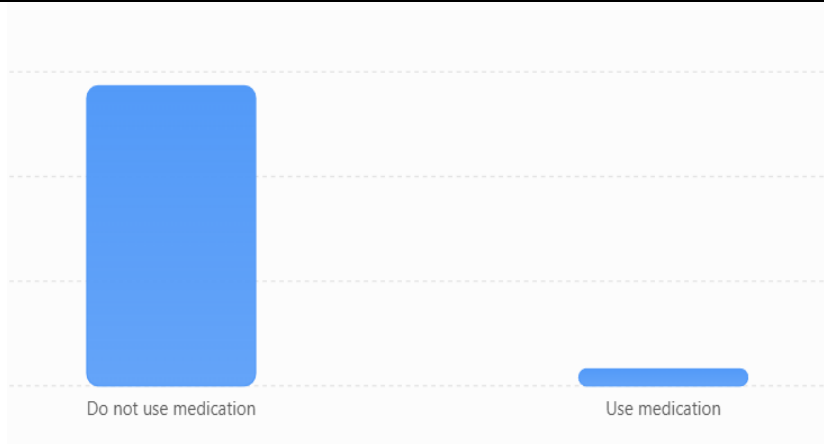
Medication Use for Sleep

Medication usage for sleep refers to the use of any prescribed or non-prescribed medication or sleep aid by an individual to help initiate sleep, maintain sleep, or improve sleep during the specified period.

Medication use	Frequency	Percentage
Do not use medication/sleep aids	430	94.71%
Use medication/sleep aids	24	5.29%
Total	454	100%



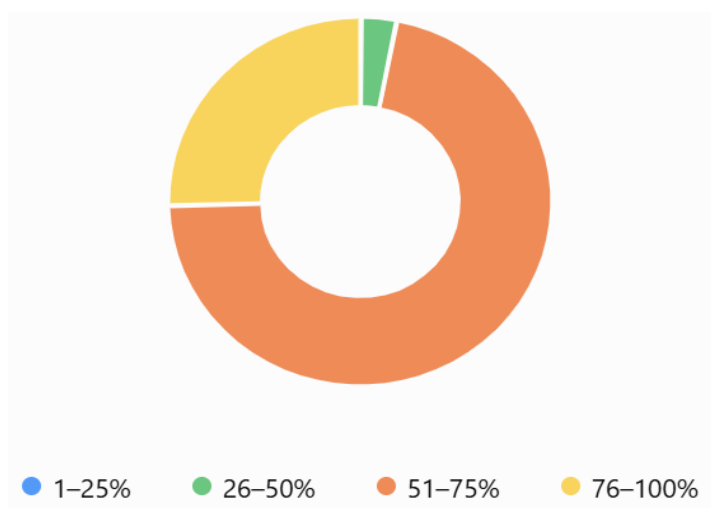
Percentage score	Performance category	Cases	Percentage
1–25%	Poor sleep pattern / High risk	0	0.00%
26–50%	Fair sleep pattern / Moderate risk	13	2.86%
51–75%	Good sleep pattern / Mild risk	325	71.59%
76–100%	Correct sleep pattern / No risk	115	25.33%
Total		453	99.78%
Missing / not scored	—	1	0.22%
Total study cases		454	100%

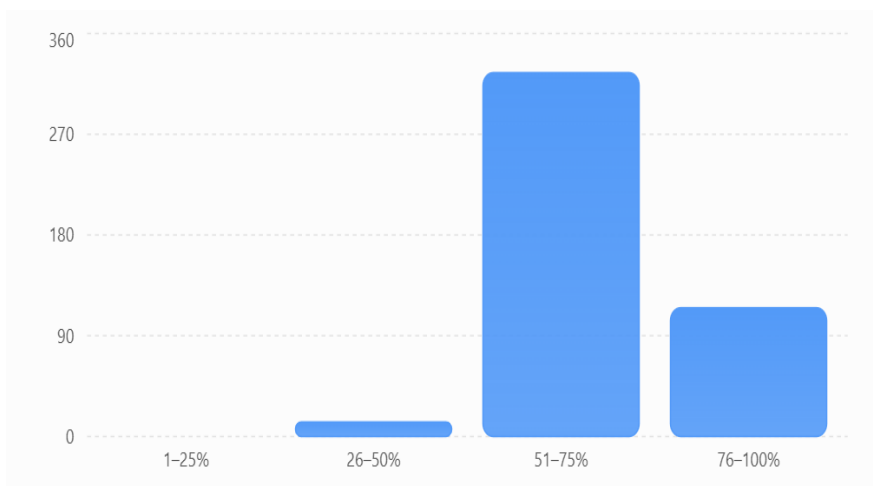


The medication-use distribution showed that 430 individuals (94.71%) did not use medication or sleep aids, whereas only 24 individuals (5.29%) reported using medication or sleep aids to help them sleep. Thus, the vast majority of the study population did not depend on medication for sleep, while a small proportion reported medication use.

Percentage Score-wise Distribution

Percentage score-wise distribution is the classification of participants according to the percentage of total scores they obtain in a questionnaire or assessment.



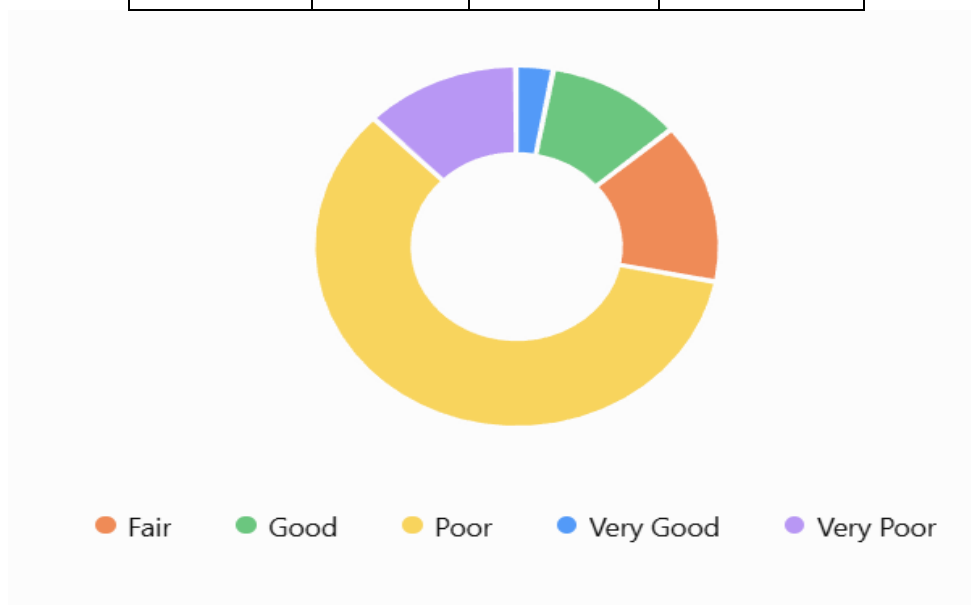


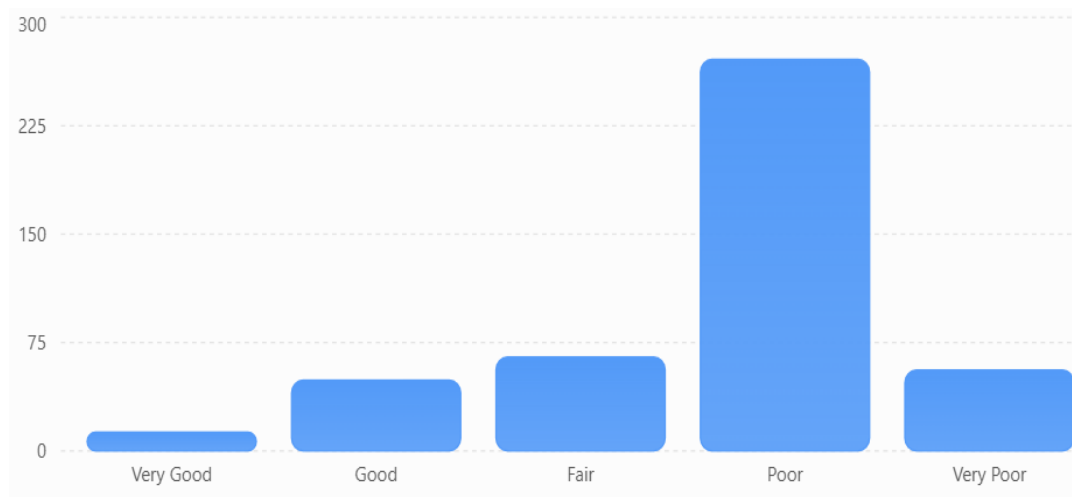
The mean score was roughly 68.80%. Of the respondents, 325 (71.74%) scored between 51 and 75%, indicating a good sleep pattern with mild risk; another 115 (25.39%) scored between 76 and 100%, indicating a correct sleep pattern with no risk; only 13 (2.87%) scored between 26 and 50%, and none scored between 1 and 25% high-risk.

Sleep quality distribution:

Sleep quality distribution refers to the frequency and percentage of respondents according to their self-reported overall quality of sleep, categorized as Very Good, Good, Fair, Poor, and Very Poor.

Sleep Quality	Score Code	Frequency (n)	Percentage (%)
Very Good	1	13	2.86%
Good	2	49	10.79%
Fair	3	65	14.32%
Poor	4	271	59.69%
Very Poor	5	56	12.33%
Total		454	100%





The bar graph shows that Poor sleep quality was the most common category, with 271 cases (59.69%). This was followed by Fair (65; 14.32%), Very Poor (56; 12.33%), Good (49; 10.79%), and Very Good (13; 2.86%).

9. Discussion

This study used a structured questionnaire to assess 454 participant's sleep performance. Young adults, especially those between the ages of 19 and 20, made up the majority of participants. With 209 males (46.04%) and 245 females (53.96%), the gender distribution was fairly even. According to the overall scoring system, 115 respondents (25.39%) received a score of 76–100%, indicating a correct sleep pattern with no risk, while 325 respondents (71.74%) were placed in the 51–75% category, indicating a good sleep pattern with mild risk. None of the respondents were categorised as high risk, and only 13 (2.87%) fell into the 26–50% moderate-risk range. Of the respondents, 24 said they used sleep aids, while 430 said they did not. However, 271 respondents (59.69%) reported having poor sleep quality, which raised concerns. Overall, the findings highlight the importance of sleep hygiene, regular sleep schedules, suitable sleeping environments, and healthy lifestyle practices.

10. Conclusion:

In this cross-sectional study, 454 students' sleep patterns, duration, and quality were evaluated using a questionnaire. Most participants were young adults between the ages of 18 and 21, with slightly more females (53.96%) than males (46.04%). According to the overall questionnaire results, 25.39% of respondents had a proper sleep pattern with no identified risk, while 71.74% of respondents had a good sleep pattern with mild risk. Individual responses, however, showed that 59.69% of participants had poor sleep quality. 94.71% of respondents reported not using any sleep aids or medications. These results emphasise how crucial it is for students to get enough sleep, follow regular sleep schedules, use fewer electronics right before bed, manage their stress, and practise good sleep hygiene. Sleep-related issues may be avoided if bad sleeping habits are identified early.

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