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Category_Class-7) Effects of
Sleep Deprivation IARCO2025 -
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by Sanaul Haque

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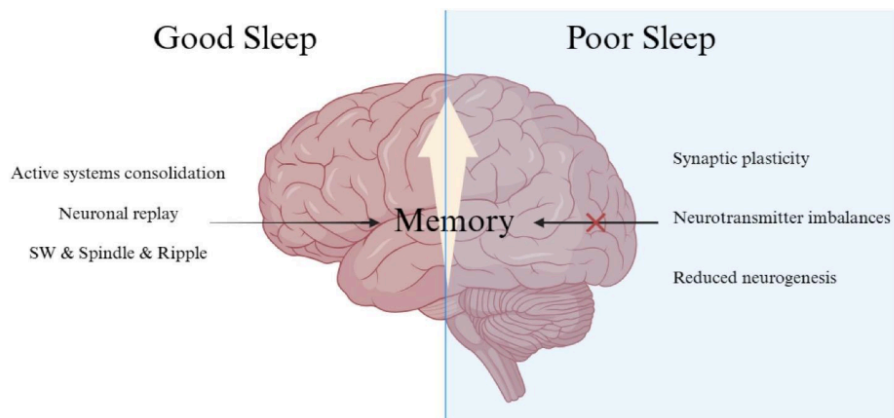
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IARCO RESEARCH PROPOSAL (2025)

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Category: Junior	Class: 7	Country: Bangladesh
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Research Topic: Assessing the Causes of Sleep Deprivation and Discussing Its Impacts and Solutions: A Comparative Analysis between Adolescents and Adults		

Title: Assessing the Causes of Sleep Deprivation and Discussing Its Impacts and Solutions: A Comparative Analysis between Adolescents and Adults



Abstract:

Sleep deprivation has become a growing concern among both adolescents and adults, with wide-ranging impacts on physical and mental health. This proposal examines existing biological and psychological studies on sleep deprivation and identifies gaps in the current understanding of its causes and consequences. It emphasizes the importance of prioritizing health and awareness in addressing this issue. The study seeks to answer critical research questions related to the behavioral and environmental factors contributing to sleep loss and provides a framework for developing strategies to mitigate its effects.

Key Research Questions:

Frequent questions raised on the topic of “Sleep Deprivation” are listed below:

- *What is “Sleep deprivation” and what are its causes and effects, that have severe effects on the psychological and physical health of people?*
- *Why should proper research be conducted on this subject what are the obstacles which increase the difficulty in mitigating sleep deprivation?*
- *What strategies can be implemented to mitigate the issues of sleep deprivation, and raise proper awareness of people in prioritizing health before profession/work?*

Research Objectives:

This research proposal seeks to provide detailed information on the following topics:

- ❖ *Providing sufficient amount of knowledge regarding sleep deprivation and its effects.*
- ❖ *To fill in the gaps in previous researches, and to highlight the problems of sleep deprivation in both academic and economic life.*
- ❖ *Suggesting easy-to-implement and effective solutions regarding this topic.*

Introduction:

Sleep deprivation is a detrimental condition that affects a significant portion of the population, specifically the youthful and the middle-aged population, impairing cognitive capacity and diminishing the body’s overall functional efficiency. All the organ systems of the body are linked to the brain, and absence of sleep or a significant amount of sleep loss can cause disturbance to the neurons of the brain, resulting in damage of the systems of the body. Millions of people in every nation, suffer from lack of sleep. Sleep deprivation can either be caused through psychological health issues, biological issues, overwork and so on. In adolescents specifically (individuals between the ages of 10 and 17), sleep is extremely fundamental in developing their physical, social,

and academic functioning and it is recommended that adolescents sleep for around 8–10 h every day [10]. Many researches have been conducted on the subject of “Sleep Deprivation”. It still remains an essential study, even till today, as it has significant negative effects on the health of people. Moreover, it is indirectly linked with global and economic advancement of a nation.

- **Adverse Impacts on Biological and Psychological Health:** Sleep deprivation has severe impacts on the well-being of an individual if not treated properly with importance. Sleep deprivation causes lasting effects on people, which causes decline in the efficiency of the human body.
- **Strategies to mitigate this issue:** Most issues of sleep deprivation are combatable through reduction of obsession or addiction towards devices. Electronic back-lit devices like cell phones, tablets, readers, and computers emit short-wavelength enriched light, also known as blue light [1][2]. However, there are few cases, which are non-recoverable, as they are caused due to special medical conditions, which on the positive side, be kept at a limit through proper and consistent medication. Some clinically reviewed medications to mitigate severe sleep disorders are: **pramipexole**, and **ropinirole**. Benzodiazepines frequently used are **clonazepam** and **temazepam**, while non-benzodiazepine hypnotics include **zolpidem** and **eszopiclone**, and so on [3].
- **Significance of this research:** The issue of sleep deprivation has not attained full awareness of people especially in developing countries. Students and adult workers still face difficulties in overcoming sleep deprivation due to overwork or negligence in the proper care of sleep. This research seeks to highlight the nature of this problem, and alert the citizens and the government of every nation to take immediate measures regarding this issue.

Literature Review:

Numerous researches have been conducted on sleep deprivation, and important are summarized below to create a

I. Some Common Causes of Sleep Deprivation:

- **Overwork or anxiety:** This can result in the constant alertness of the brain and as a result, falling asleep is hindered. Overwork, such as professional overtime or late-night exam preparation, often leads to sleep deprivation.
- **The influence of social media:** This is a significant contributing factor of sleep loss among the youthful population. Countless hours of scrolling through social media on electronic devices is a major cause of sleep deprivation, as it results completely falling into an addiction.
- **Harmful Wavelengths of Light Emissions:** The electronic devices such as smartphones and tablets emit the “short-wavelength blue light” a type of light emitted at night or in a

dark place, that is known to suppress melatonin (a type of sleep hormone) production, disrupting the act of falling asleep [1].

- **Medical and Physiological Conditions:** Conditions like Insomnia, sleep apnea, and other sleep disorders adversely affects the quality of sleep experienced by the patient.

II. Significant Effects of Sleep Deprivation:

- **Experiencing Difficulties in Concentration:** The addiction of social media, stimulates dopamine release, leading to heightened cognitive activity and intrusive thoughts, particularly during nighttime. This increased mental arousal can disrupt the initiation and maintenance of sleep, thereby contributing to sleep deprivation. If unchecked for a long time, the brain starts to process fall images resulting in hallucinations and anxiety to sleep at night, with the constant feeling of 'being watched'.
- **Damage to The Circulation and Overall Function of the Organ Systems:** Without adequate sleep, the body is unable to circulate enough nutrients and oxygen-rich blood to aid in proper respiration of the body. This is because, sleep also affects different parts of your immune system, which become more active at different times of day. For example, when you sleep, a particular type of immune cell works harder. That is why people who do not sleep enough may be more likely to get colds and other infections [4].
- **Inefficiency and inaccuracy in the work output:** Adolescents, especially students who study for long periods into the night limiting their sleep at night, face difficulties in remembering information and details compared to a student with a healthy sleep routine. Adults who work in important jobs, such as in government, or in various services, periodically lose their quality of work, when they receive inadequate sleep of a continuous period of time.

III. Gaps in previous researches and overlooked details:

- **Available information on Sleep Deprivation:** Sleep Deprivation is increasing significantly in the developing nations of our world. Sleep is a restorative process that replaces aging cells, supports growth, and helps the brain sort and store information. Without sufficient sleep, the body cannot function optimally, and serious health issues may arise. Sleep is vital for physical restoration, cognitive function, and emotional well-being. Chronic sleep deprivation, defined as consistently obtaining less than seven hours of sleep per night, has been linked to several serious health conditions. These include hypertension, cardiovascular disease, dementia, and mood disorders. Insufficient sleep disrupts the body's natural circadian rhythms, elevates stress hormones like cortisol, and impairs immune function, all of which contribute to the development and progression of these health issues. Prioritizing adequate sleep is essential for maintaining overall health and preventing long-term medical complications [5].

- **Introduction to organized detail-rich solutions to mitigate sleep deprivation:** The introduction of methods and strategies to analyze and assess the issue of sleep deprivation have not clearly been introduced or highlighted in many research, thus inadequate knowledge on sleep deprivation is provided to the people of the nations. Psychological stressors like deadlines, exams, marital conflict, and job crises may prevent us from falling asleep or wake us from sleep throughout the night [9]. The measures that can be taken are:
 1. To reduce the work pressure among the adults and growing adolescents. Homeworks and tests for students should be maintained, but there should be resting periods among them.
 2. To educate the children and their parents/guardians in ensuring a good-quality sleep besides academics.
 3. To Reduce disturbances from noise, light, and extreme temperatures while sleeping by using earplugs, blinds, or devices like an electric blanket or air conditioner. Even minor nighttime sounds or glowing lights can affect sleep quality. Aim to maintain a comfortable bedroom temperature—neither too hot (over 75°F) nor too cold (under 54°F) [9].
 4. Occasional holidays should be ensured, and people should gain a decent amount of rest and sleep on these days, including the weekends.

IV. The need for immediate actions based on present conditions:

- **Statistics on the present conditions of sleep deprivation among the people:** Based on National Sleep Foundation (2015) guidelines for categorizing total sleep duration, the recommended sleep duration to be: for school-age children (6–13 years) 9–11 h, teenagers (14–17 years) 8–10 h, young adults and adults (18–64 years) 7–9 h and older adults (≥65 years) 7–8 h. Less or more than the recommended TST (in hours) was considered 'shorter' and 'longer' sleep time, respectively [6]. Sleep research suggests that a teenager needs between eight and 10 hours of sleep every night, however Most teenagers only get about 6.5–7.5 hours of sleep per night [7] and on some occasions even less than 6 hours of sleep.
- **The negligence of the sleep quality of people:** Fatigue and performance impairment from sleep loss can interact with the law in various ways, influencing civil and criminal liability as well as workplace regulations such as government policies, workers' compensation, and disability law. These concerns are often highlighted through examples from the commercial road transport industry in common law countries. Moreover, awareness of

sleep-related disorders may alter legal judgments, while advances in diagnosis, treatment, and fatigue-monitoring technologies are likely to introduce new legal challenges [8].

Research Methodology:

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This study is a **comparative research** analyzing the effects of sleep deprivation on adolescents and adults, compared to individuals with a healthy sleep routine. Both **quantitative** (test scores, physical performance) and **qualitative** (survey responses, personal experiences) methods will be used to assess differences in cognitive and physical performance.

Research Among the Adolescents: For research among the adolescents 50 students (n=50) of the same class are to take part, out of them 25 are sleep deprived and the other 25 are healthy. A sample test, requiring critical and logical thinking is conducted. The time taken for the sleep deprived students and the student with adequate sleep is also to be monitored, as about 70% the students with better sleep quality are expected to complete the test accurately within the time limit (The 70% is an estimated value, excluding hypothetical possibilities of students making multiple inaccuracies, or being unable to finish within the given time). This will be a two-sided research. After the writing test, the students are to be tested for their physical strengths, out of whom, the sleep deprived students are expected to perform significantly unwell, as compared to the student with sufficient amount of sleep. The students will be provided a survey, based on their average screen time and their daily hobbies and habits. To ensure honest answers, the questions will be asked in a friendly and welcoming manner, to boost their confidence.

Research Among the Adults: For research among the adults, 20 individuals (n=20) working in professions including office work, and documenting tasks are to participate in a practical writing test, to devise a solution to a specific problem set to them. 10 individuals are sleep deprived and the other 10 individuals have a healthy sleep routine. The problem assigned to them, may require logical and practical thinking, and there may be multiple solutions. They will also be given a survey, which will be used to determine the average conditions of a working individual and how it affects their sleep. This research is to compare the, functionality and the efficient thinking skills of the healthy and sleep deprived individuals. The purpose of this research is to identify the factors influencing the sleep of the individuals. There results will be analyzed, as the needed data for this research, to determine their performance quality based on sleep.

The Practicalities and Timeline of the Research: The research is straightforward and will be conducted over two days for adolescents: one day for the writing test and the second day for the practical/physical test. The results will help determine the average sleep requirement for adolescents and compare it to their current sleep patterns. For adults, the research will take one day, during which participants will complete the writing test and a survey about their daily routines and sleep habits. The findings will be used to raise awareness about the importance of prioritizing health alongside academic and professional responsibilities.

Conclusion:

Based on the studies made on sleep deprivation, numerous solutions have been introduced. The primary aim of this research is to make a comparative note among the sleep qualities of adolescents and adults. Overall, reviewing the research proposal, we have seen that sleep deprivation is currently on the increase, and some effective methods are introduced to mitigate the issues. This research seeks to raise awareness on the sleep disorders among the people, through the results of the tests and surveys conducted as experiment, in determining the most healthy and suitable sleep routine for an individual. These strategies are encouraged to be implemented to reduce the rate of sleep deprivation and disorders among the people. This research will be a complete success, if the strategies are implemented by the people properly.

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