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Original Research Article

Internet usage on sleep quality and cognition among adults

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ABSTRACT

Context: A lot of folks use social networking sites every day. Adults now often browse social networking sites thanks to the rise in smartphone use. Their cognition and sleep cycles may be impacted by this habit. The purpose of this study was to ascertain how internet addiction affected both sleep quality and cognition.
Aims: To ascertain how internet use affects the quality of sleep. To examine the relationship between adult internet addiction and cognition.
Environment and Design: Cross-sectional prospective study was the study's design.

1. Study location: Karpaga Vinayaga Institute of Medical Sciences and Research Center, Department of Physiology.
2. One month of study.
3. Study population: adults between the ages of 18 and 22.
4. 100-sample minimum (Sample size = P(1-P)/d2/Z1-a/22/Z1-a/22).
5. Simple random sampling is the sample design.

Materials and Methods: Preliminary data will be gathered after receiving ethical approval and informed consent. The Montreal Cognitive Assessment (MOCA) Questionnaire, the Pittsburgh Sleep Quality Index (PSQI), and the Internet Addiction Test (IAT) were used to collect the data. Inclusion standards: 18 to 22-year-old age range.
Major mental and neurological conditions; individuals with head injuries; exclusion criteria.
Utilizing statistical analysis all data was entered into an MS Excel data sheet, and after the study is over, SPSS software version 17.0 will be used to statistically analyse the data. The average, standard deviation, and percentage of the data were displayed.
Results: It has been demonstrated through our study that adults are increasingly using smartphones to visit social networking sites. Their cognitive and sleep patterns are both impacted by this behaviour. Therefore, it is crucial to spread the crucial knowledge among students in order to encourage the proper internet usage pattern and lessen students' sleep issues.
Key Message: In order to prevent sleep issues, we must raise awareness among students about the need of using the internet in the right way.

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1. Introduction

With numerous programmes available on desktop computers, laptops, tablet computers, and a smart watch

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connected to each smartphone, the Internet has become an integral part of our life. Due to this phenomena, consumers no longer know exactly when they are "off-line." Irrespective of the type of activity one engages in once online, internet addiction (IA) is described as a psychological dependence on the internet. Researchers have identified the parallels between these behavioural norms by discovering that excessive internet use shares common symptoms (such as withdrawal, mood change, and tolerance) with pharmaceutical addictions. It could affect the lives of heavy users in a number of ways, including how they interact with others, if they lose valuable hobbies, and even how they go about daily tasks like sleeping.

We spend about a third of our lives sleeping. Healthy living depends on getting a good sleep. Rejuvenating vitality and enhancing physical attractiveness and wellbeing are two of people's most basic desires. Without sufficient or quality sleep, the body and mind deteriorate, which may influence one's behaviour. Due to the significance of sleep and its quality in human life, numerous researchers have examined various facets of sleep quality, which serves as an important barometer of overall wellbeing, as well as sleep disorders.[1]

A sleep disorder is a condition that is characterised by alterations in sleep habits or patterns. Changes in sleep physiology may accompany several sleep disorders. Serious sleep disorders can have a negative impact on a person's personal life as well as the lives of their family, coworkers, and society at large. The term "sleep disorder" refers to a condition that affects the regularity, quality, and quantity of sleep. It includes conditions like[2] early sleep onset, continuous sleep, and early arousal;[1] excessive sleepiness;[3] sleep and wake-up pattern disorders; and[4] parasomnia, which is characterised by abnormal movements, behaviours, emotions, perceptions, and dreams that happen as one is falling asleep.

Internet-based communication has become an integral element of life today. Therefore, increasing internet usage has led to significant psychological and social issues. Throughout the course of human evolutionary history, technical innovations like early tools, spoken language, writing, and arithmetic systems have changed our cognitive systems. The Internet first appeared as the newest technical development poised to fundamentally alter human cognition thirty years ago. The Internet environment has significantly changed our thinking and behaviours thanks to its many benefits. They exhibit greater multitasking behaviours, which are associated with heightened distractibility and subpar executive function. Additionally, Internet-related addictive behaviours that show altered reward-processing and self-control systems are more prevalent in digital natives. Recent neuroimaging studies have suggested links between these cognitive effects of the Internet and structural alterations in the brain. There is growing anxiety over how the Internet will affect our cognitive systems, yet some scholars have bemoaned the fact that these worries are frequently overstated in light of the available scientific data. The purpose of the current study is to give an objective assessment of the impact of internet use on adult sleep quality as well as a correlation between internet addiction and cognition.

2. Materials and Methods

2.1. Participants

This cross-sectional prospective study was conducted in the Department of Physiology with healthy adults between the ages of 18 and 22. We excluded individuals who had used the internet for less than a year and those who were hesitant to participate from our study, which was based on a basic random sampling and included 100 undergraduate students from both genders. Questionnaires that were self-administered were used to gather the data. Data collecting continued from August through September.

2.2. Procedure

After describing the goals, methods, and voluntariness of the research, the consent for participation was gained.

Following the receipt of ethical clearance, preliminary data were gathered. The Montreal Cognitive Assessment (MOCA) Questionnaire, the Pittsburgh Sleep Quality Index (PSQI), and the Internet Addiction Test (IAT) were used to collect the data.

2.3. Sleep pattern

Pittsburgh Sleep Quality Index was used to evaluate students' sleep quality (PSQI). A 19-item tool called the PSQI measures sleep quality over the course of a month. A higher score on the PSQI, which ranges from 0 to 21, indicates poorer sleep quality. To ascertain if the student matched the requirements for poor sleep quality, we employed the PSQI global score more than 5, which had a sensitivity of 89.6% and a specificity of 86.5%[5]. On the other hand, the mediation analysis used the PSQI score on a continuous scale. In the present investigation, the PSQI's internal consistency was insufficient (Cronbach's alpha = 0.610).

2.4. Internet addiction

Using Young's 20-item Internet Addiction Test, undergraduate students' internet addiction was evaluated (IAT). A single IAT item's score can range from 1 (rarely) to 5. (always). IAT composite scores can be anything between 20 and 100, with higher scores indicating greater internet addiction. It was decided whether the student satisfied the requirements for internet addiction by looking at whether their IAT score was greater than or equal to 40, as recommended earlier. Instead, the IAT score on

a continuous scale was used in the mediational model. Internal consistency of IAT was quite good in this study population (Cronbach's alpha = 0.8).

2.5. *Montreal Cognitive Assessment (MoCA)*

The Montreal Cognitive Assessment (MoCA), a quick screening tool for mild cognitive impairment, was created. It evaluates several cognitive functions, including executive functions, memory, language, visual-constructional abilities, conceptual thinking, arithmetic, and direction. It also measures attention and concentration. A score of 26 or more is regarded as normal; there are a total of 30 potential points.

The information thus received was examined using SPSS version 28 and appropriate statistical techniques. Statistics were judged significant at P0.05. The chi square test was used to evaluate the impact of internet addiction on cognition. Internet addiction and cognition were correlated using Pearson correlation.

The information was entered into an excel workbook made with Microsoft and exported to SPSS.

3. Results

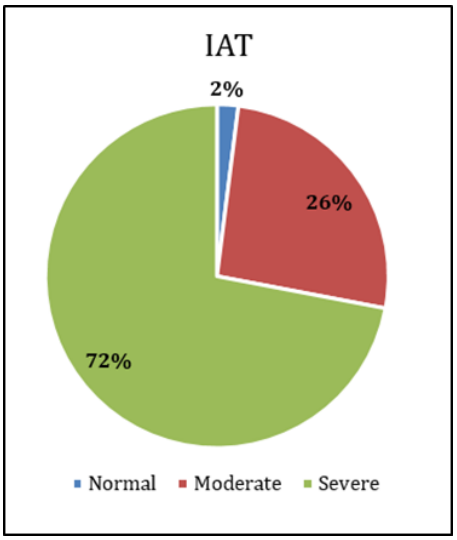

Fig. 1: Incidence of internet addiction

Table 1: Anthropometric parameters of the subjects

Anthropometric measurements	Mean ±Standard deviation
Age (in years)	21.32±2.06
Height (in meters)	2.68 ± 0.41
Weight (in kg)	60.15 ± 12.40

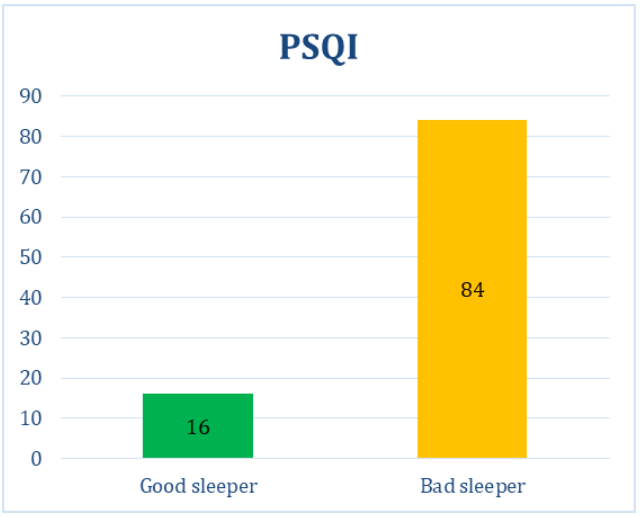

Fig. 2: Distribution of study participants according to quality of sleep

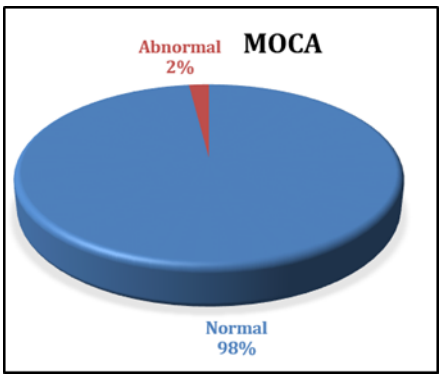

Fig. 3: Distribution of study participants according to cognition

Table 2: Association between PSQI and Internet addiction

Parameters	Mean ± SD	P Value
ITA	56.6 ± 16.6	<0.001
PSQI	10.63 ± 4.9	
ITA	56.6 ± 16.6	<0.001
MOCA	28.8 ± 2.8	
PSQI	10.6 ± 4.9	<0.001
MOCA	28.8 ± 2.8	

4. Discussion

Participants' median ages ranged from 21.32 to 2.06, with a maximum age of 25 and a minimum age of 19. According to our research, sleep latency is the most typical sleep issue among students. The frequency of sleep disorders among students was 84%. Mohammadi reported a 43.2% prevalence of sleep problems in a study of university students in Ardabil, whereas Medical Sciences University of Kurdestan reported a 57.4% prevalence. According to Ghoreishi's research, 40.6% of Tehran University of

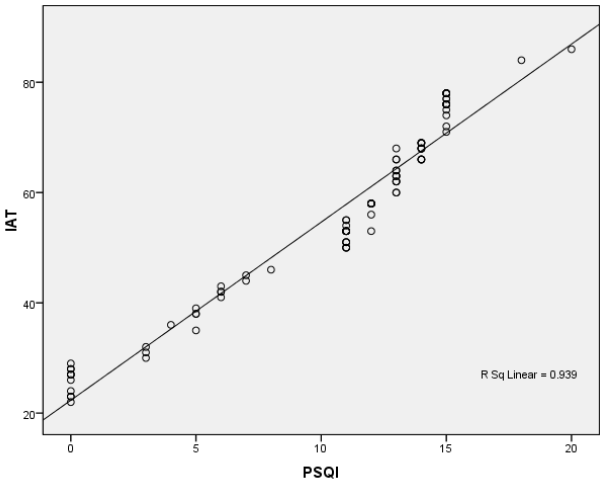

Fig. 4: Correlation between IAT Score and sleep quality

Medical Sciences students have sleep disorders.[3] The rising prevalence of sleep disorders among students appears to be a result of their worries about their present and potential future academic and professional circumstances.

In a research on daytime sleepiness and academic performance in Sao Paulo medical students, Rodriguez found that 22% of students had the condition by the end of the six-month period, up from 39.53% at the start of the semester.[4] According to a survey on the older population in Spain, insomnia affects 11.3% of people.[6] According to reports, 33% of Californian males and 6% of other European populations suffer from sleeplessness.[7,8]

Furthermore, Suganuma discovered a significant difference between light users (29.0%) and heavy users (53.5%) (p=0.02) regarding perceptions of insufficient sleep in a study on the use of electronic media (television and computers) in connection to perceived sleep.[2]

This author[2] asserts that "media use before sleep should be given attention as a cause of perceived insufficient sleep." In a previous study, the authors discovered that teens who used computers at night reported having much worse sleep quality (74.04%) than those who did not. 9 However, we did not anticipate that internet use between the hours of 19:00 and 24:00 would be the biggest risk factor for inadequate sleep among college students.

Our study focused on the presence of IA and its direct relationship with sleep quality, which was found to be both substantial and favourable. IA and QOL have been linked to adolescent suicidal ideation, according to a Chinese study.[9] 26,688 pupils from 29 different high schools made up the sample size. Smoking and alcohol consumption were factors in their studies as well, which may have contributed to IA as well as poor QOL and suicidal ideation. 11-14 Similar to a prior study conducted in Iran, this study found that students with IA had poor sleep habits.[10] In their three-year study, which included 174 medical students, it was discovered that IA causes medical students to have reduced QOL, which further affects their physical, psychological, and social domains. Recent research conducted in Hong Kong on 273 young adults between the ages of 18 and 30 showed that IA was associated with a low quality of life.[11] This finding was consistent with our research, but their sample size was insufficient to accurately represent the Hong Kong young adult population as a whole. However, it is impossible to ignore the findings regarding the harmful effects of IA on both physical and psychological health. This result corroborated our study's findings that IA did negatively impact both sleep quality and pattern. However, in the Gujarat study, 23.8% of participants reported having poor sleep, while 76.2% reported having good sleep.[12] However, those who had poorer sleep quality had higher IAT scores than those who had better sleep quality, which was consistent with our study. In addition to causing sleep difficulties, poor sleep can have an adverse effect on a person's mental health and general welfare.

Although new studies have started to explore the potential impacts of widespread Internet use on the cognitive capacities of young adults, we cannot be certain at this time whether Internet use is producing a generation with "fundamentally different cognitive talents." Our research demonstrates that severe IAT affects cognition. 2011 saw Sparrow and associates explore how undergraduate students' memories changed when they anticipated access to information later.[13] Students were less likely to recall specific knowledge when they were anticipated to have access to it in the future, but they were more likely to remember where to obtain the exact information.[13] In a recent study, a group of university students were examined to see how being a member of highly connected networks (like the Internet) affects the spread of accurate information as well as the underlying cognitive methods required to produce accurate information.[5] The study's findings imply that being a part of highly connected networks can aid people in problem-solving by aiding the spread of accurate information, but that these networks do not spread the cognitive techniques required to independently acquire accurate information.[5] These ingeniously constructed studies imply that while the consequences of Internet use on cognition are probably complex, they may help young adults develop certain cognitive techniques. The conducted study included some restrictions. Data were gathered from a constrained study area. The study was unable to include all students. Not enough of each academic field was represented. As a result, the findings of this study cannot be extrapolated to the entire population, and additional research in this area is needed.

5. Conclusion

The results of our study demonstrate that adults are increasingly using smartphones to visit social networking sites. Their cognitive and sleep patterns are both impacted by this behaviour. Therefore, it is crucial to raise students' understanding of the need for proper internet usage in order to decrease sleep issues among students.

6. Source of Funding

None.

7. Conflicting Interest

Nil

8. Acknowledgement

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