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Original Article

Relationship of Internet Addiction with Depression, Anxiety and Stress and sleep quality among MBBS Students

Dr Sneha Mudgal[1], Dr Raghuveer Choudhary[2], Dr Omprakash Dudi[3]

[1]MBBS, MD Physiology, Senior Resident, Physiology, Dr SNMC, Jodhpur
[2]MBBS, MD physiology Senior Professor, Physiology, Dr SNMC, Jodhpur
[3]MBBS, MD Psychiatry, Junior specialist, DH, Barmer

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Corresponding Author:

Dr Raghuveer Choudhary
MBBS, MD physiology Senior Professor, Physiology, Dr SNMC, Jodhpur

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ABSTRACT

Background: The rapid growth of internet use has led to increasing concerns regarding internet addiction (IA) among students. This study explores the relationship between IA, psychological distress (depression, anxiety, and stress), and sleep quality among medical students in India, a population facing high academic demands.

Methods: A cross-sectional study was conducted among 150 MBBS students at Dr. S.N. Medical College, Jodhpur. Data were collected using Young's Internet Addiction Test (IAT), the Depression, Anxiety, and Stress Scale-21 (DASS-21), and the Pittsburgh Sleep Quality Index (PSQI). Statistical analysis was performed using SPSS Version 23.0.

Results: The prevalence of 'Internet Addicts' was 13.3%, while 31.3% were 'Over-users.' Male students and hostellers reported significantly higher IA and psychological distress scores ($p < 0.05$). A strong positive correlation was found between IA and depression ($r = 0.565$), stress ($r = 0.549$), and anxiety ($r = 0.509$). Additionally, 50.7% of students reported poor sleep quality, which correlated significantly with IA ($r = 0.484$), likely due to the 84% of participants using the internet primarily at night.

Conclusion: Internet addiction is significantly associated with deteriorated mental health and poor sleep quality among medical students. The findings highlight an urgent need for digital wellness programs and counseling services within medical institutions to mitigate the adverse effects of excessive screen time on future healthcare professionals.

Keywords: *Internet Addiction, Depression, Anxiety, Sleep Quality, Medical Students, India.*

INTRODUCTION

The use of the internet has experienced rapid growth since the beginning of the 21st century, becoming a globally expanding tool for information and a user-friendly communication medium[1]. The internet has connected people from various parts of the world and different fields of science and education, becoming an essential component of academic work, research, and education. It is now difficult for individuals, particularly students, to imagine accomplishing their scholarly pursuits without the internet[2].

India stands as the second-largest internet user globally. Recent data from the Telecom Regulatory Authority of India (TRAI) shows that the total number of internet users in the country rose from 795.18 million at the end of December 2020 to 825.30 million at the end of March 2021 [3].The prevalence of internet usage among young individuals, specifically those aged between 15 and 24 years old, is remarkably high. The widespread availability of smartphones and tablets has made the internet an integral part of most students' lives. Students utilize the internet for various educational and academic purposes, such as accessing electronic databases, communicating with teachers and peers, and participating in online courses and learning activities[4]. Additionally, they engage in non-educational activities, such as communication, entertainment, leisure, and social media use[5].

Excessive internet use has given rise to various terms, including internet addiction (IA), pathological internet use, internet use disorder, and problematic internet use[6]. Among these, IA is the most commonly used term to describe the phenomenon of excessive internet use. Internet addiction, is defined as the "inability to stop internet overuse, a tendency to perceive offline time as meaningless, excessive irritation and aggression during deprivation. Its risks and consequences can be compared to other forms of addiction. Internet addiction is described in terms of a loss of control over internet use, poor time management, and an insatiable craving for the internet, leading to social problems[7].

Internet addiction has been associated with various psychological, physical, and social problems, including impaired work function, academic underachievement, sleep disturbances, unhealthy eating habits, headaches, eye strain, social isolation, and relationship difficulties [9]. Internet addiction has also been found to be significantly associated with some psychiatric disorders such as alcohol abuse, attention deficit and hyperactivity, depression, and anxiety Symptoms include clinically measurable psychological stress anxiety and depression, eating disorders, sleeplessness and mood changes with suicidal ideation[10] .

Sleep quality and disturbances are frequently linked to internet addiction, particularly among adolescents. Research indicates that internet use is associated with delayed bedtimes, difficulty falling asleep, and increased nocturnal awakenings[11]. The excessive use of the internet and subsequent sleep disturbances can leave students feeling physically and psychologically exhausted, leading to reduced time dedicated to academic activities, lower academic performance, and a decrease in their overall motivation for education[12].

Poor sleep quality has been linked to a range of negative outcomes, including depressive symptoms, difficulties in social interactions with peers, impaired daytime functioning, a weakened immune system, and increased fatigue[13] . The existing literature suggests that sleep quality can be influenced by various factors, such as age, gender, psychosocial influences, cultural background, and daily habits, including addictions.

Some experts in the field of mental health and research view excessive internet use as a manifestation of underlying disorders such as stress, anxiety or depression, rather than an independent condition[14]. The experience of stress among college students is influenced by a variety of factors, both related to academics and other aspects of their lives. The demanding nature of academic assignments, high workloads, and challenges associated with studying are frequently identified as significant contributors to stress among nursing and midwifery students[15]. Additionally, the apprehension of unfamiliar situations and concerns about making mistakes while interacting with patients or handling technical equipment contribute to stress in clinical settings for nursing and midwifery students. Furthermore, it has been reported in a study that information overload can also result in stress among nursing students[16] .

While internet addiction is a growing concern, limited data is available specifically for India. Research studies on internet addiction, sleep quality, and mental health problems have been conducted in various countries, but there is a lack of evidence concerning internet addiction, poor sleep quality, and related issues among medical students in India[17]. Therefore, this study aims to explore the relationship between sleep quality, internet addiction, and its contributing factors among medical students in India. The findings of this study will provide valuable insights, particularly considering that medical students are future healthcare professionals who may encounter patients struggling with internet addiction.

MATERIALS AND METHODS

The study was conducted with the approval of the institutional ethics committee of Dr. S.N. Medical College, Jodhpur. Participants included MBBS students from the 2021 batch who had been using mobile internet for one year or more. Both male and female students were included in the study. The sample size was determined using the formula for estimating a single sample proportion, with a 95% confidence interval and 20% relative allowable error. The calculated sample size was 122 students, which was increased and rounded to 150 subjects.

The study enrolled second-year MBBS students who were above 18 years of age, had successfully completed their first year, and had been using mobile internet for at least one year. Students with any chronic diseases or those who had been previously diagnosed with and receiving treatment for depression, anxiety, stress, or sleep disorders were excluded from the study.

Informed consent was obtained from all participants before their enrollment in the study. The participants were interviewed using a detailed pre-structured questionnaire written in English. The questionnaire included questions to collect socio-demographic information such as name, age in years, gender, current residence (hostel/home), duration of internet usage (<6 hrs/day and >6 hrs/day), purpose of internet usage (emails, social media, education, entertainment), usual time of internet use (day or night), and academic performance.

Data were collected using three questionnaires: Young's Internet Addiction Test, the Depression, Anxiety, and Stress Scale-21 (DASS-21), and the Pittsburgh Sleep Quality Index.

1. The Internet Addiction Test (IAT) developed by Dr. Kimberly Young is a validated instrument used to assess internet addiction. It consists of a 20-item questionnaire measured on a five-point Likert scale. Scores on the IAT range from 20 to 100, with different score ranges representing different levels of internet usage. Scores between 20 and 49 indicate average users with complete control over their internet use. Scores between 50 and 79 represent over-users experiencing frequent problems due to their internet use. Scores between 80 and 100 indicate internet addicts facing significant problems caused by their internet use.
2. The Depression Anxiety Stress Scale-21 (DASS-21) is a set of three self-report scales designed to measure emotional states of depression, anxiety, and stress. It consists of 21 items measured on a four-point Likert scale. Each scale includes seven items divided into subscales. Scores for depression, anxiety, and stress are calculated by summing up the scores for the relevant items. Cut-off scores are used to categorize individuals into different severity levels for each subscale. For depression, the cut-off scores are as follows: normal (0-4), mild (5-6), moderate (7-10), severe (11-13), and extremely severe (14+). For anxiety, the cut-off scores are: normal (0-3), mild (4-5), moderate (7-10), severe (11-13), and extremely severe (10+). For stress, the cut-off scores are: normal (0-7), mild (8-9), moderate (10-12), severe (13-16), and extremely severe (17+).
3. The Pittsburgh Sleep Quality Index (PSQI) was utilized to assess the quality of sleep. It consists of 19 Likert-type items that cover seven components related to sleep: sleep quality, sleep latency, sleep duration, sleep disturbances, habitual sleep efficiency, use of sleep medications, and daytime dysfunction. The sum of scores from these components yields a global score ranging from 0 to 21, with higher scores indicating poorer sleep quality. A cut-off point of 5 is used to categorize individuals as having poor sleep quality or not.

Data analysis was conducted using SPSS Version 23.0 (IBM SPSS Statistics for Windows, Version 23.0, IBM Corp, Armonk, NY). Categorical data were presented as numbers and percentages, while continuous data were summarized using the mean and standard deviation. The association between categorical variables was examined using the Chi-square test of association. A p-value less than 0.05 was considered statistically significant

OBSERVATIONS AND RESULTS

1. Descriptive Analysis of Study Variables

Table 1 presents the central tendency and dispersion of the studied parameters, including age, internet addiction levels, and psychiatric health metrics.

Variable	N	Mean	SD	Min	Max
Age (Years)	150	20.30	1.035	18	23
IAT Score	150	47.95	20.043	20	90
Depression	150	12.84	8.939	0	48
Anxiety	150	10.49	6.558	0	28
Stress	150	13.41	8.285	0	34
PSQI (Sleep)	150	6.02	3.071	1	18

2. Gender-Based Comparisons

Table 2 summarizes the differences in mean scores between male and female students across all variables.

Variable	Male (Mean)	Female (Mean)	P-Value
IAT Score	53.03	42.88	0.0017
Depression	14.99	10.69	0.0029
Anxiety	11.81	9.17	0.0110
Stress	15.33	11.49	0.0042
PSQI Score	6.80	5.24	0.0017

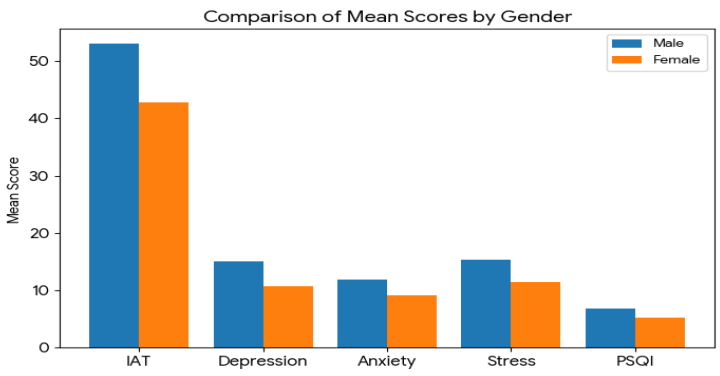

Figure 1: Mean score comparison across variables differentiated by gender.

3. Residence and Psychological Metrics

Variable	Home (Mean)	Hostel (Mean)	P-Value
IAT Score	35.44	51.62	<0.0001
Depression	7.94	14.28	<0.0001
Stress	10.65	14.22	0.0267
PSQI Score	4.53	6.46	0.0011

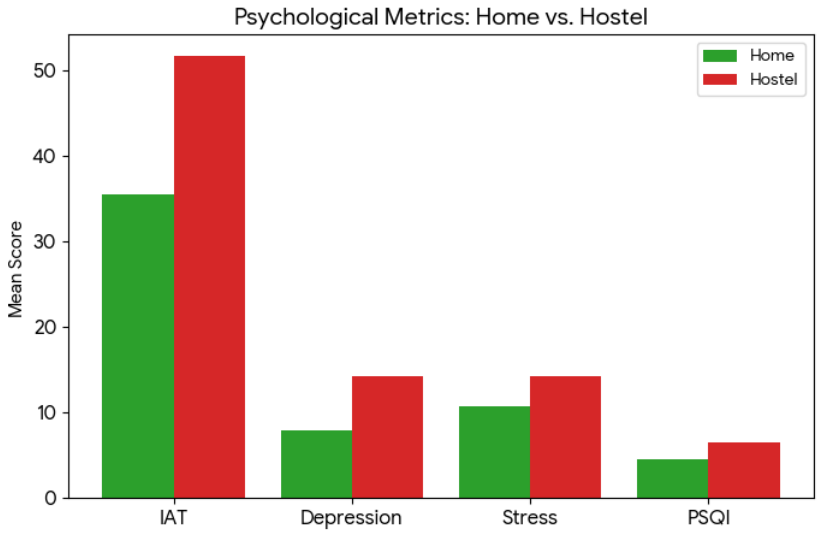

Figure 2: Impact of living environment on addiction and health scores.

4. Behavioral Patterns and IAT Grading

IAT Grade	Frequency	Percentage
Average User	81	54%
Over-User	47	31.3%
Addict	20	13.3%
Normal	2	1.3%

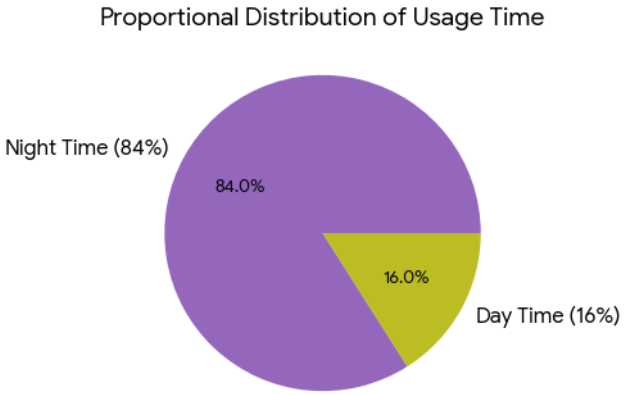

Figure 3: Predominant timing for internet activities among medical students.

5. Summary of Significant Positive Correlations

Internet addiction exhibits a strong and statistically significant positive correlation with all studied psychological metrics ($p < 0.001$).

Metric Pair	Pearson Correlation (r)
IAT & Depression	0.565
IAT & Stress	0.549
IAT & Anxiety	0.509

IAT & PSQI (Sleep)	0.484
Depression & Stress	0.633

DISCUSSSION

Overview of Findings

The present study aimed to evaluate the prevalence of internet addiction and its association with psychological states (depression, anxiety, and stress) and sleep quality among medical students [18,19]. Our findings reveal a significant prevalence of problematic internet use, with 13.33% of students falling into the category of 'Internet Addicts' and 31.33% classified as 'Over-users.' These results underscore the growing concern of digital dependency within the medical student population, where the internet has become an inseparable tool for both academic and social engagement[20,21].
Prevalence of Internet Addiction

The addiction rate observed in this study aligns with various national and international research. For instance, studies among professional college students in India have reported prevalence rates ranging from 10% to 20%, varying by the specific assessment scales used. The high percentage of 'over-users' (31.33%) suggests a large subgroup of students who, while not clinically addicted, are at high risk of developing severe dependency and associated mental health issues[22].

Impact on Mental Health: Depression, Anxiety, and Stress

A cornerstone of this study was the evaluation of the relationship between IAT scores and DASS-21 scores. The strong positive correlation between internet addiction and depression ($r = 0.565$) suggests that excessive screen time may either lead to social isolation and depressive symptoms or act as a maladaptive coping mechanism for existing low moods[23]. Similarly, the correlation with anxiety ($r = 0.509$) and stress ($r = 0.549$) indicates that high-frequency internet use, particularly on social media, may expose students to 'FOMO' (Fear of Missing Out), cyberbullying, and social comparison, all of which elevate stress and anxiety levels[24].

Internet Addiction and Sleep Quality

Our results indicate that over half of the study population (50.7%) experienced poor sleep quality. The correlation between IAT and PSQI scores ($r = 0.484$) confirms that as internet addiction increases, sleep quality significantly deteriorates. This is largely attributed to the 'Night Time' usage pattern observed in 84% of the participants[25]. Exposure to blue light from screens suppresses melatonin secretion, delaying the circadian rhythm and reducing total sleep duration, which is particularly detrimental for medical students who require high cognitive functioning for their demanding curriculum.

Gender and Residential Influences

Interestingly, male students showed significantly higher mean scores for internet addiction and psychological distress compared to female students. This finding is consistent with some literature suggesting that males may be more susceptible to gaming or specific forms of internet-based entertainment. Furthermore, hostellers exhibited much higher addiction levels than day-scholars. The lack of direct parental supervision, combined with the reliance on the internet for social connection while away from home, likely contributes to this disparity.

Limitations and Future Recommendations

While this study provides valuable insights, it is limited by its cross-sectional design, which precludes establishing a causal relationship. Future longitudinal studies are needed to determine whether internet addiction causes psychological distress or vice versa. We recommend that medical institutions implement digital wellness programs and provide counseling services to help students manage their screen time and improve their sleep hygiene and mental well-being.

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