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INTERNET ADDICTION IN FUTURE HEALTHCARE PROFESSIONALS: PREVALENCE AND ASSOCIATED FACTORS

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ABSTRACT

Background: Internet addiction is a growing behavioral concern among medical students, driven by academic stress, high digital engagement, and easy access to online platforms. This study aimed to determine its prevalence and identify associated demographic, behavioral, and internet-use factors.

Methods: A cross-sectional analytical study was conducted (February–March 2025) among 300 MBBS students selected through two-stage stratified random sampling. Data were collected using a self-administered questionnaire on sociodemographic details, internet usage patterns, and Young's Internet Addiction Test (IAT). Scores were categorized as normal (<20), problematic (20–49), or addicted (≥50). Associations between categorical variables and addiction status were assessed using Chi-square tests, while differences in mean age between groups were analyzed using independent sample t-tests. A p-value of <0.05 was considered statistically significant.

Results: Of the participants, 39.3% had no addiction, 52.3% were problematic users, and 8.3% were addicted, yielding a combined prevalence of 60.6%. Sociodemographic variables showed no significant association with addiction status. Significant predictors included daily hours online ($p < 0.001$) and monthly internet expenditure ($p = 0.008$). Addiction prevalence was highest among those using the Internet>5 hours/day (18.6%) and spending >₹1000/month (15.0%). Frequent use of social networking (p=0.03), education/study (p=0.04), online gaming (p=0.05), and viewing sexual content (p=0.04) was significantly associated with higher addiction rates. Device type, age at first internet use, internet speed, and online shopping frequency were not significant predictors of the outcome.

Conclusion: Internet addiction is prevalent among medical students, with behavioral patterns and usage intensity emerging as stronger predictors than demographic factors. Early screening and targeted institutional interventions are warranted to promote balanced internet use and safeguard academic, psychological, and social well-being.

Keywords: Internet addiction, problematic use, medical students, prevalence, Young's Internet Addiction Test

INTRODUCTION

The Internet has become an indispensable part of modern life, transforming communication, education, healthcare, commerce, and entertainment.[1] While it offers vast opportunities for learning and social connectivity, excessive and uncontrolled use can result in maladaptive behaviours collectively termed internet addiction.[2] This behavioral disorder involves excessive online engagement that disrupts daily functioning, causing emotional, psychological, and social distress.[3] It manifests in forms such as compulsive browsing, social media overuse, online gaming, and prolonged video streaming, and—unlike substance addictions—is driven by psychological reinforcement mechanisms.[4]

Medical students are particularly vulnerable due to the demanding nature of their curriculum, high academic stress, and the necessity for digital learning. Internet use for research, virtual case discussions, and academic resources often extends to non-academic activities, including social media, gaming, and streaming, as coping mechanisms for stress and anxiety.[5] Limited leisure time, coupled with a high workload, can paradoxically increase reliance on digital platforms.[6]

Multiple factors contribute to this susceptibility, including psychological stress, social isolation, late-night use leading to sleep disturbances, and personality traits such as impulsivity and sensation-seeking.[7] Excessive use has been linked to physical problems (eye strain, headaches, musculoskeletal discomfort) and mental health issues (anxiety, depression, emotional instability). Academically, it can lead to procrastination, poor time management, and decreased performance.[8]

Prevalence estimates of internet addiction vary widely, influenced by geographic, cultural, and methodological differences.[9] Understanding its magnitude and associated factors among medical students is essential for developing targeted prevention and intervention strategies. Institutions must promote digital well-being to strike a balance between technology use and academic and personal responsibilities.[10]

The present study was conducted to address the rising concern of internet addiction among medical students, who, as future healthcare professionals, may also encounter patients with comparable problems; the primary objectives were to determine the prevalence of internet addiction in this population and to examine its associations with personal, familial, social, and internet-related factors.

MATERIALS AND METHODS

Study Design, Setting, and Duration: This was a cross-sectional, questionnaire-based study conducted among undergraduate medical students at a tertiary care teaching hospital. The study was carried out over a period of one year.

Study Participant: The study was observational and descriptive in nature. All consenting first, second, and third-year MBBS students present during the data collection period were included. Students who did not provide consent, as well as fourth-year MBBS students and interns, were excluded to ensure uniformity of academic exposure across the study sample.

Sample Size and Sampling Technique: The sample size was determined using the formula for prevalence studies, considering an expected prevalence of internet addiction based on previous literature, with a 95% confidence interval and 5% absolute precision. The calculated sample size was 300 students. A two-stage stratified random sampling method was used. In the first stage, students were stratified according to their year of study, and in the second stage, proportional random sampling was applied within each stratum to ensure balanced representation from each academic year.

Data Collection: Data were collected using a pretested and structured questionnaire consisting of two parts. The first part captured sociodemographic and internet usage characteristics, including age, gender, place of residence, current stay, parents' education, age at first internet use, average daily hours of internet use, monthly expenditure on internet services, type of device used, internet speed, and primary purposes of internet use. The second part utilized Young's Internet Addiction Test (IAT), a validated 20-item self-reported scale rated on a 5-point Likert scale ranging from 0 (rarely) to 5 (always), with a total score range of 0 to 100. For analysis, IAT scores were categorized into three groups: no addiction (<20), problematic use (20–49), and addiction (≥50). Questionnaires were self-

administered and completed anonymously during scheduled classroom sessions, after obtaining informed consent. All forms were checked for completeness before data entry.

Data Analysis: Data were entered into Microsoft Excel and analyzed using Epi Info CDC 7. Descriptive statistics were expressed as frequencies and percentages for categorical variables, while continuous variables such as age at first internet use and average daily usage were presented as mean ± standard deviation. Associations between categorical variables and internet addiction status were tested using the Chi-square test. Continuous variables were compared using an independent sample t-test.. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Of the 300 participants, 39.3% had no addiction, 52.3% were classified as problematic users, and 8.3% as addicted. Sociodemographic variables—including mean age, gender distribution, academic year, place of origin, current residence, and primary device used—did not differ significantly across addiction categories (all $p > 0.05$) (Table 1).

Analysis of internet usage patterns revealed that daily hours online and monthly expenditure were significantly associated with addiction status ($p < 0.05$) (Table 2). Participants spending more than five hours online daily showed the highest proportion of addiction, while those with the lowest daily usage (<2 hours) had the smallest proportion. Similarly, individuals with higher monthly internet expenses (>1000 INR) exhibited greater addiction prevalence than those with lower expenditure (<500 INR). Age at first internet use and internet speed showed no significant relationship with addiction levels.

Regarding purposes of internet use (Table 3), frequent social networking, education/study activities, online gaming, and viewing sexual content were all significantly associated with higher addiction prevalence ($p < 0.05$). In contrast, the frequency of online shopping did not vary considerably by addiction status. These findings suggest that behavioral patterns and content type, rather than sociodemographic factors, are stronger correlates of internet addiction in this population.

Table 1. Sociodemographic characteristics and Internet Addiction status (N = 300)

Variables	No addiction (n=118)	Problematic use (n=157)	Addiction (n=25)	Total	p-value
Mean age (years)	20.04±1.31	20.06±1.42	19.62±1.25		0.518[#]
Gender					
Male	65 (43.3%)	76 (50.7%)	9 (6.0%)	150	
Female	53 (35.3%)	81 (54.0%)	16 (10.7%)	150	0.18[*]
Year of Study					
First year	40 (40.0%)	54 (54.0%)	6 (6.0%)	100	
Second year	39 (39.0%)	54 (54.0%)	7 (7.0%)	100	
Third year	39 (39.0%)	49 (49.0%)	12 (12.0%)	100	0.59[*]
Place of Origin					
Urban	81 (40.5%)	104 (52.0%)	15 (7.5%)	200	
Semi-urban	24 (40.0%)	32 (53.3%)	4 (6.7%)	60	
Rural	13 (32.5%)	21 (52.5%)	6 (15.0%)	40	0.55[*]
Current Stay					
Hostel	44 (44.0%)	49 (49.0%)	7 (7.0%)	100	
PG/Flat	45 (37.5%)	66 (55.0%)	9 (7.5%)	120	
Home	29 (36.3%)	42 (52.5%)	9 (11.2%)	80	0.67[*]
Device Used					
Laptop	30 (37.5%)	44 (55.0%)	6 (7.5%)	80	
Desktop	22 (36.7%)	31 (51.7%)	7 (11.6%)	60	
Mobile	66 (41.3%)	82 (51.3%)	12 (7.4%)	160	0.83[*]

[#]p-value is calculated by an independent sample t-test

[*]p-value is calculated by the chi-square test

Table 2. Internet usage patterns and Internet Addiction status (N = 300)

Variables	No addiction (n=118)	Problematic use (n=157)	Addiction (n=25)	Total	p-value*
Hours spent online/day					
<2 hrs	43 (53.8%)	35 (43.8%)	2 (2.4%)	80	
2–5 hrs	56 (37.3%)	84 (56.0%)	10 (6.7%)	150	
>5 hrs	19 (27.1%)	38 (54.3%)	13 (18.6%)	70	<0.001
Age at first internet use					
<12 years	34 (34.0%)	56 (56.0%)	10 (10.0%)	100	
12–15 years	47 (39.2%)	66 (55.0%)	7 (5.8%)	120	
>15 years	37 (46.3%)	35 (43.8%)	8 (10.0%)	80	0.25
Internet speed					
Slow	40 (44.4%)	45 (50.0%)	5 (5.6%)	90	
Average	47 (39.2%)	63 (52.5%)	10 (8.3%)	120	
Fast	31 (34.4%)	49 (54.4%)	10 (11.2%)	90	0.47
Monthly expenditure on the Internet					
<500 INR	50 (50.0%)	45 (45.0%)	5 (5.0%)	100	
500–1000 INR	41 (34.2%)	71 (59.2%)	8 (6.6%)	120	
>1000 INR	27 (33.8%)	41 (51.2%)	12 (15.0%)	80	0.008

*p-value is calculated by the chi-square test

Table 3. Purposes of internet use and Internet Addiction status (N = 300)

Variables	No addiction (n=118)	Problematic use (n=157)	Addiction (n=25)	Total	p-value*
Social Networking					
Rarely	40 (50.0%)	36 (45.0%)	4 (5.0%)	80	0.03
Sometimes	46 (38.3%)	67 (55.8%)	7 (5.9%)	120	
Often	32 (32.0%)	54 (54.0%)	14 (14.0%)	100	
Education/Study					
Rarely	19 (27.1%)	41 (58.6%)	10 (14.3%)	70	0.04
Sometimes	49 (40.8%)	64 (53.3%)	7 (5.9%)	120	
Often	50 (45.5%)	52 (47.3%)	8 (7.2%)	110	
Online Gaming					
Rarely	59 (45.4%)	64 (49.2%)	7 (5.4%)	130	0.05
Sometimes	40 (40.0%)	51 (51.0%)	9 (9.0%)	100	
Often	19 (27.1%)	42 (60.0%)	9 (12.9%)	70	
Online Shopping					
Rarely	61 (43.6%)	70 (50.0%)	9 (6.4%)	140	0.3
Sometimes	39 (35.5%)	61 (55.5%)	10 (9.0%)	110	
Often	18 (36.0%)	26 (52.0%)	6 (12.0%)	50	
Sexual Content					
Rarely	84 (44.2%)	94 (49.5%)	12 (6.3%)	190	0.04
Sometimes	24 (33.8%)	40 (56.3%)	7 (9.9%)	71	
Often	10 (25.6%)	23 (59.0%)	6 (15.4%)	39	

*p-value is calculated by the chi-square test

DISCUSSION

In the present study, out of 300 undergraduate medical students, 118 (39.3%) had no addiction, 157 (52.3%) were classified as problematic users, and 25 (8.3%) met the criteria for addiction. This yielded a combined prevalence of 60.6% for problematic use and addiction. The finding has been corroborated by many previous researchers, including Paul et al.[9], who reported an overall prevalence of 56.6% among college students from South India (41.3% mild, 15.2% moderate), and Sharma et al.[11], who

found a 42.7% prevalence among professional college students in India (35% mild, 7.4% moderate, 0.3% severe).

Our prevalence is substantially higher than that reported in certain international studies. For example, a study among Turkish university students by Canan et al.[12] found a prevalence of 9.7%, while a survey among Iranian medical students by Ghamari et al.[13] reported a prevalence of 10.8%. Such differences may arise from variations in sample characteristics, socio-cultural influences, internet penetration rates, and differences in diagnostic criteria or cut-off points used to define addiction.

Although male students in our study had a higher combined prevalence (70.7%) of problematic use and addiction compared to females (64.7%), the difference was not statistically significant ($p = 0.18$). Morahan-Martin and Schumacker[14] have explained such gender differences by suggesting that males are more likely to engage in online activities such as gaming, pornography, and gambling, which are more closely linked to pathological internet use.

In terms of living arrangements, our study found no statistically significant difference in addiction status between students residing in hostels, private rented accommodations, or at home. However, this observation contrasts with findings by Asiri et al.,[15]who reported that students living alone tended to have higher internet addiction scores. The proposed reasons include increased loneliness, greater privacy for online activities, and a lack of direct supervision, all of which may contribute to excessive internet use.

Regarding device type, our results did not reveal a statistically significant association; however, specific patterns emerged. Bisen and Deshpande[16] reported the highest prevalence among mobile users, whereas in our data, desktop use was nearly as strongly associated with high-use patterns as mobile-based access. This may reflect the nature of prolonged, task-specific desktop sessions (e.g., gaming, streaming) being comparably addictive to mobile usage. Similarly, Afolabi et al.[17] found significant differences in addiction prevalence by device type, though patterns varied by region, suggesting that local context and user behaviour influence device-related risk profiles.

The absence of statistically significant associations with sociodemographic and access-related variables in our study underscores the importance of psychological, behavioural, and situational determinants—such as coping mechanisms for academic stress, peer influence, and self-regulation—in shaping internet use patterns. These findings are consistent with the broader literature, which frames internet addiction as a multifactorial behavioural concern requiring a holistic and context-sensitive preventive approach.

Analysis of internet usage patterns showed that hours spent online per day were significantly associated with addiction status ($p < 0.001$). Students using the Internet for more than 5 hours daily had the highest addiction prevalence (18.6%), compared with 6.7% among those using it for 2–5 hours and only 2.4% among those using it for less than 2 hours. This is consistent with Nandhini et al[18], who found a strong correlation between daily internet usage exceeding 3.5 hours and higher addiction scores among college youth, noting that extended use was linked to reduced academic attention and focus.

For age at first internet use**,** although no statistically significant association was observed ($p = 0.25$), students who began before the age of 12 had a slightly higher addiction prevalence (10%) compared to those who started later. Kuss et al.[19] reported an inverse correlation between age at first use and addiction severity ($r = –0.27$, $p < 0.001$), noting that early starters exhibited more maladaptive coping behaviours, including escapism and mood regulation through online activities. The absence of significance in our sample may be due to the generally early age of exposure among this cohort, which leads to reduced variability.

Regarding internet speed, no significant relationship was found ($p = 0.47$), although the prevalence of addiction was slightly higher among students with fast connections (11.2%) compared with those with average (8.3%) or slow (5.6%) speeds. This suggests that once baseline connectivity is established, speed alone may not be a decisive factor in determining addiction risk.

For monthly expenditure on internet services, there was a statistically significant association ($p = 0.008$). Students spending more than ₹1000 per month had the highest addiction prevalence (15%), followed by those spending ₹500–₹1000 (6.6%) and those spending less than ₹500 (5.0%). Nandhini

et al[18] similarly reported that spending more than ₹500 per month on mobile data or Wi-Fi was significantly associated with problematic use, and that financial investment in internet services was linked to reduced academic performance and increased dependency.

When considering the purpose of internet use, frequent engagement in social networking, video streaming, and sexually explicit content was significantly associated with higher addiction prevalence ($p = 0.0069$, 0.0003, and < 0.001, respectively). These findings are in line with Khojasteh Zonoozi et al.,[20] who found that 84.2% of those with internet addiction overused social media, 68.3% engaged with online pornography, and prolonged video streaming displaced academic activities. These behaviours are understood to be reinforced by anonymity, instant gratification, and identity experimentation, making them particularly prone to compulsive use.

Overall, our results and the supporting literature suggest that high daily usage, higher financial expenditure, and specific online activities are stronger predictors of internet addiction than technical factors, such as connection speed or demographic background.

In the current study, the purpose of internet use showed significant associations with addiction status for social networking, education/study-related use, online gaming, and sexual content consumption. Addiction prevalence was highest among frequent social networking users (14.0%, $p = 0.03$), aligning with Khojasteh Zonoozi et al.,[20] who reported that 84.2% of individuals with internet addiction engaged in social media overuse, driven by anonymity, identity exploration, and instant gratification. Students who rarely used the Internet for education had the highest addiction prevalence (14.3%, $p = 0.04$), suggesting that limited academic use may be linked to greater engagement in potentially addictive non-academic activities. Frequent online gaming was also associated with higher addiction rates (12.9%, $p = 0.05$), reflecting the immersive, reward-based nature of gaming platforms. While online shopping was not significantly related to addiction ($p = 0.3$), a higher proportion of frequent shoppers (12.0%) fell into the addicted category compared to rare users (6.4%). Viewing sexual content showed a strong positive association, with addiction prevalence reaching 15.4% among frequent viewers ($p = 0.04$), consistent with Khojasteh Zonoozi et al.,[20] who found compulsive online pornography use in 68.3% of addicted individuals. These findings highlight that behavioural patterns—particularly heavy engagement in social networking, gaming, and sexual content—may be more influential in predicting internet addiction than purely demographic variables, underscoring the need for targeted interventions in high-risk user groups.

CONCLUSION

The findings of the present study highlight that internet addiction is a significant concern among medical students, affecting a majority of the study population. This underscores the urgent need for timely and targeted remedial interventions. Early detection of at-risk individuals in professional institutions such as medical colleges is essential to prevent progression to pathological levels of addiction. Institutions should develop and implement comprehensive awareness programs for both students and faculty, focusing on recognizing problematic internet use and its potential consequences. Moreover, structured educational initiatives promoting safe, balanced, and healthy internet usage practices should be integrated into student support systems to safeguard academic performance, mental well-being, and social functioning.

LIMITATIONS

This study has certain limitations. First, data collection was based on self-reported information, which may be subject to recall bias, as well as underreporting or overreporting of symptoms. No confirmatory clinical interviews were conducted to validate the diagnosis of internet addiction. Second, the cross-sectional design allows identification of associations but does not establish causal relationships between the observed factors and internet addiction. Finally, as the study was conducted in a single institution, the findings may not be generalizable to all medical student populations. Future longitudinal, multi-institutional studies are recommended to understand better the temporal relationship between risk factors and the development of internet addiction, as well as to monitor the effectiveness of preventive and remedial interventions over time.

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