



PREVALENCE AND IMPACT OF INTERNET USE HABITS IN MEDICAL AND DENTAL STUDENTS AT A TERTIARY CARE CENTRE

Medical Education

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ABSTRACT

Backgrounds and Aim: Internet use has made our lives better in many ways and has now become an integral part of our life. With this comes the darker side that is Internet addiction. This addiction can lead to compromised Physical Health, Mental Health, interpersonal relationships and Work/Academic Performance. **Materials and Methods:** This cross-sectional study included 300 dental and medical students, were subjected to a convenience sampling and enrolled on the basis of completely filled responses to an online questionnaire. The study was conducted between June 2022 & December 2022, as an online survey available within the different departments of the university. Demographic, educational and personal details along with Internet Addiction Test (IAT) and Problematic Internet Use Questionnaire (PIUQ) were recorded from all the students. **Results:** Mobile usage among the students ranged from 1.5 & 6 hours per day, mean use was 3.821.25 hours per day. Mean PIUQ score was 48.8013.16, while mean IAT score was 69.7016.94. **Conclusion:** The findings of the present study suggest that there is a high prevalence of Internet Addiction, especially in students in professional courses like Medical and Dental. There is an imminent need to carefully monitor and evaluate the addiction levels at various institutes and take appropriate measures to limit internet use and manage the internet addiction.

KEYWORDS

Internet Addition, Mental Health, Academic Performance, Medical Students, Dental Students

INTRODUCTION:

Internet addiction refers to a compulsive behaviour pattern characterized by excessive and unhealthy use of the internet, which can lead to negative consequences in various areas of a person's life^{1,3}. The severity and impact of internet addiction, can vary based on individual factors, cultural influences, societal trends and age^{4,5}. Individuals, who spend excessive amounts of time online, neglect their responsibilities, and experience distress when unable to access the internet is likely to have a more severe form of addiction. Not only does this impacts, Physical or Mental Health, but might also be a challenge in interpersonal relationships, social anxiety disorder (SAD) social phobia and Work/Academic Performance^{6,7}. Additionally, insomnia, depression, low self-esteem, anxiety disorders and personality trait disorders are also reported higher in individuals with internet addiction⁸.

Internet addiction can further attribute to degradation of academic orientation, financial misconduct/losses, occupational challenges due to lack of concentration or easily being swayed by the addiction and eventually poorer ability to create and maintain relationships^{9,10}. Among young medical and dental students, who are being intrigued various sources of information (sometimes mis-information as well), are at the bottom of the receiving end of a spiralling situation, where on one hand, most of the day's job and learning resources are available on the internet and the motivation to excel pushes them to further utilise these sources (often as FOMO-Fear Of Missing Out, yet another form of anxiety), on the other hand, the over dependence and utilisation of these resources, gradually succumbs them to Internet addiction.

Evaluating internet addiction and its severity involves assessing an individual's behaviour, thoughts, and emotions related to their internet usage. Several assessment tools and criteria can help determine the extent of someone's internet addiction. One commonly used tool is the Internet Addiction Test (IAT), developed by Dr. Kimberly Young¹¹.

Another tool that has been developed by Caplan in 2002, consists of 18 items that assess various aspects of an individual's internet use behaviour and its impact on their daily life; it is known as "Problematic

Internet Use Questionnaire" (PIUQ)^{12,13}. The PIUQ explores different dimensions of internet usage and its potential negative effects. Respondents rate each item on a scale from 1 (strongly disagree) to 7 (strongly agree). The questionnaire helps identify the presence and severity of problematic internet use by examining several factors, including: Salience, Excessive Use, Neglect of Duty, Lack of Control, Neglect of Social Life and Escape from Reality.

While there have been various studies from parts of India including participants from various universities/medical and dental colleges, there is a complete void in terms of such studies from our centre. Being one of the most prestigious Dental & Medical university in North India, the present study was planned to evaluate internet addiction and its severity among dental and medical students at our tertiary care centre.

Materials and Methods:

This cross-sectional study included dental and medical students (Under- and Post-Graduate) at a tertiary care centre. For this study, convenience sampling design was used where data was collected through Google Forms (online survey). All the students of the university were shared the link to participate and those willing to participate, filled the form. Demographic, educational and personal details were collected along with IAT and PIUQ from all the students. The data sheet was filtered for contingencies of duplicate or incomplete records; Records with any error or any other inconsistency were omitted. Post filtering the records, entries from 300 students were included in the final analysis.

Tools

Internet Addiction Test (IAT):

The IAT is a self-report questionnaire that asks individuals to rate the frequency and impact of various internet-related behaviours on their lives. It consists of 20 statements, and respondents rate each statement on a scale from 1 (rarely) to 5 (always). The scores are then calculated to categorize individuals into different levels of internet addiction severity; 0-30: No addiction or minimal addiction, 31-49: Mild internet addiction, 50-79: Moderate internet addiction, 80 and above: Severe internet addiction.

Problematic Internet Use Questionnaire (PIUQ):

The questionnaire helps identify the presence and severity of problematic internet use by examining several factors, including:

1. **Salience:** The extent to which the internet dominates the individual's thoughts, feelings, and activities.
2. **Excessive Use:** The amount of time spent online and the frequency of use.
3. **Neglect of Duty:** Whether internet use interferes with responsibilities and obligations.
4. **Lack of Control:** Difficulty in controlling or reducing internet use despite attempts to do so.
5. **Neglect of Social Life:** The impact of internet use on social interactions and relationships.
6. **Escape from Reality:** Using the internet as a way to escape from real-life problems or negative emotions.

Scoring: 18-54: Low problematic internet use, 55-72: Moderate problematic internet use, 73 and above: High problematic internet use.

Statistical Analysis

All the data was collected in a single excel sheet at the end of the online survey. SPSS ver 23 was used to analyse the data. All the categorical data was presented in terms of Frequency (number) & Percentage, while the continuous data was presented in Mean & SD. Comparison of categorical data between two groups was done with the help of Chi-square test, while, comparison of continuous data was done using Independent samples t'-test.

RESULTS:

Mean age of the students was 23.393.94 years and ranged through 19 to 35 years. Majority were females (62.7%). Gender ratio was 0.6:1. Majority of the students were from Undergraduate (MBBS/BDS) courses (71.7%), while remaining were from Post-graduates (MDS/MD/MS). Mobile usage among the students ranged from 1.5 & 6 hours per day, mean use was 3.821.25 hours per day. Mean PIUQ score was 48.8013.16, while mean IAT score was 69.7016.94. According to PIUQ category, there was dominance of low problematic internet usage pattern (67.7%) followed by moderate problematic (26.3%) and high problematic pattern (6%) respectively. As per Young's IAT category, majority of students had moderate addiction (58%) followed by severe addiction (29.7%), mild addiction (7%) and no or minimal addiction (5.3%) respectively (Table 1). On evaluating the association of demographic characteristics (age, sex and marital status) on IAT category, only marital status emerged to have a significant association. It was seen that prevalence of moderate to severe addiction was significantly lower in married (44.4%) as compared to unmarried students (89%) ($p=0.001$) (Table 2). However, evaluation of association of PIUQ category with demographic characteristics showed a significant relationship of higher category of problematic usage with younger age and male sex ($p<0.05$) (Table 3). Comparison of mean duration of internet use, PIUQ and IAT scores revealed association of younger age with significantly longer duration of internet use ($p<0.001$) and significantly higher PIUQ scores ($p=0.022$). Gender-wise differences seen for PIUQ scores only which were found to be significantly higher in males as compared to that in females ($p=0.027$). However, married status was significantly associated with shorter duration of internet use ($p<0.001$) and lower PIUQ and IAT scores ($p<0.001$) (Table 4).

DISCUSSION:

Internet addiction has become a pressing concern, affecting both professionals and students alike, with far-reaching consequences in their personal and academic/professional lives. This addiction, characterized by excessive and compulsive use of the internet, has penetrated every facet of modern society due to the omnipresence of digital devices and online platforms. Professionals and students, who heavily rely on the internet for work, education, and leisure, are particularly susceptible to its detrimental effects. In the context of professional students, internet addiction can be a silent disruptor of productivity and work-life balance.

Moreover, the constant need to be connected can impair one's ability to disconnect from work-related stressors, causing long-term physical

and mental health issues. Professionals who succumb to internet addiction may experience sleep disturbances, anxiety, and depression, further exacerbating their inability to perform at their best. Additionally, the addictive nature of the internet can lead to a neglect of crucial face-to-face interactions with colleagues, leading to a decline in teamwork and collaboration. For students, the impact of internet addiction is equally alarming. With the growing trend of online education and the increasing use of digital resources for learning, students are more connected to the internet than ever before. While the internet offers a wealth of information and learning opportunities, it also presents numerous distractions. Students often find themselves procrastinating with social media, online gaming, or streaming platforms, sacrificing study time and academic performance. This not only hampers their grades but also their long-term educational goals.

The present study was conducted with the aim to evaluate internet addiction and its severity among medical and dental students at a tertiary care hospital in North India. For this purpose, we used Young's IAT and PIUQ. Age of the students ranged from 19 to 35 years and students from Under-Graduate and Post-Graduate programs were included. Mean age of the students was 23.39±3.94 years. Females outnumbered Males by 1.68 times. These demographic findings of the present study were similar to the findings of Pandey and Johri¹⁴ who conducted a survey during the COVID pandemic in the same institute reported mean age of students 25.75±3.69 years and almost female respondents to be almost double than male respondents. In another study, by Kenneth¹⁵ it was reported that by the end of 2016, for every 100 male applicants, there were 157.1 female applicants in medical institutes in India. These findings are similar to the present study and highlight the decreasing gender gap, especially in medical education in India over the recent decades.

In the present study, daily mobile use ranged from 1.5 to 6 hours and average use was 3.82±1.25 hours. PIUQ and IAT of the students were 48.80±13.16 units and 69.70±16.94 units. Interestingly, majority of the students had Low to Moderate Problematic Use (94.0%), while majority had Minimal to Moderate addiction (70.3%). Ironically, while IAT was higher in younger students, it was comparable between the age groups. Further, no significant association was found for age and addiction with respect to the IAT score. On the other hand, while 98.4% female students had Low to Moderate Problematic use while 86.6% of the male students had Low to Moderate Problematic score, on comparing the PIUQ scores significantly higher score was reported in male students as compared to female (50.97±14.13 vs. 47.49±12.40 score). IAT and Internet use were comparable between genders. On comparing Internet use, PIUQ and IAT between Married and Unmarried students, significantly lower Internet use, PIUQ and IAT was found in Married students as compared to Unmarried (2.17±0.50 vs. 3.88±1.23 hrs; 33.33±2.00 vs. 49.29±13.07 units; 43.33±13.03 vs. 70.51±16.40 units). All the married students had Low Problematic use (100.0%), while a higher proportion of Married students had Mild to Moderate Addiction as compared to the Unmarried students.

Another study from North India by Bhatt and Gaur¹⁶ conducted on 320 dental students reported that 23% of the student's reported addiction to internet. Contrary to the present study, Kumar *et al.*¹⁷ reported that IAT score among 384 dental students was 13.87±11.90 score, which was very low, however this can be contributed to the fact that the present study was conducted post-COVID pandemic, which saw various changes, one of which was adaptation of technology for purpose of progression of academics, while the study by Kumar conducted study prior to the COVID pandemic. In another study, conducted in South India by Spoorthy *et al.*¹⁸ reported that mean IAT score was 32±16.42 score, which was similar to our study. In another prior study by Chaudhari *et al.*¹⁹ reported association of higher IAT with male gender, younger age and higher internet use. In a study by Cardenas *et al.*²⁰ conducted on 402 students reported the incidence of IA in 75.3%, however none had severe IA. In another study by Marzilliet *et al.*²¹ no significant association of Gender and Internet Addiction was found.

In both the professional and student spheres, the consequences of internet addiction extend beyond personal well-being to include broader societal implications. For professionals, the decreased productivity and increased absenteeism resulting from internet addiction can have a detrimental impact on the overall economy. For students, the failure to develop essential study skills and the inability to concentrate on academic tasks can hinder their future career prospects; potentially leading to a less skilled and less competitive workforce.

Addressing internet addiction requires a multi-faceted approach. First and foremost, individuals must recognize the signs of addiction and acknowledge its impact on their lives. Professionals and students should establish clear boundaries for internet use during work or study hours and prioritize face-to-face interactions with colleagues and peers. Employers and educational institutions can play a crucial role by implementing policies that encourage a healthy work-life balance and provide resources for managing digital distractions. Moreover, counselling and support services should be readily available for those struggling with internet addiction. Therapeutic interventions and cognitive-behavioural therapy have shown promise in helping individuals overcome this addiction and develop healthier online habits.

CONCLUSION:

The findings of the present study suggest that there is a high prevalence of Internet addiction, especially in students in professional courses like medical and dental. There is an imminent need to carefully monitor and evaluate the addiction levels at various institutes and take appropriate measures to limit internet use and manage the internet addiction. As, internet addiction might negatively affect mental and physical well-being of students and young adults, hence acting as a barrier in their growth, both personally and socially.

Limitation of study

The data was collected online among the students may have biased the responses. No face to face interview was conducted and data were exclusively gathered by the self-reporting questionnaire, hence social desirability bias could be present. There is also a need to create awareness about IA and associated risk factors among students, faculty and teachers. Future studies need to explore relationship of IA and depression in a more comprehensive manner.

Table 1: Demographic Profile, Personal Characteristics and Internet usage pattern of the study population

SN	Characteristic	Statistics
1	Mean AgeSD years (Range)	23.393.94 (19-35)
2	Gender	No. (%)
	Male	188 (62.7%)
	Female	112 (37.3%)
3.	Marital Status	
	Married	9 (3.0%)
	Unmarried	291 (97.0%)
4.	Professional Qualification	No. (%)
	MDS	42 (14.0%)
	MD/MS	43 (14.3%)
	BDS	54 (18.0%)
	MBBS	161 (53.7%)
5.	Mean Daily Mobile UseSD Hours (Range)	3.821.25 (1.5-6.0)
6.	Mean PIUQSD Score (Range)	48.8013.16 (30-80)
	Low Problematic	203 (67.7%)
	Moderate Problematic	79 (26.3%)
	High Problematic	18 (6.0%)
7.	Mean IATSD (Range)	69.7016.94 (21-92)
	No or Minimal Addiction	16 (5.3%)
	Mild Addiction	21 (7.0%)
	Moderate Addiction	174 (58.0%)
	Severe Addiction	89 (29.7%)

Table 2: Association of Internet Addiction pattern with demographic characteristics of study population

SN	Characteristic	Total No.	IAT Category				Statistical significance
			No/ Minimal Addiction (n=16)	Mild Addiction (n=21)	Moderate Addiction (n=174)	Severe Addiction (n=89)	
1.	Age						
	≤25 Years	212	11 (5.2%)	11 (5.2%)	126 (59.4%)	64 (30.2%)	$\chi^2=3.738$; $p=0.291$
	>25 Years	88	5 (5.7%)	10 (11.4%)	48 (54.5%)	25 (28.4%)	
2.	Sex						
	Male	112	8 (7.1%)	8 (7.1%)	67 (59.8%)	29 (25.9%)	$\chi^2=2.063$; $p=0.560$

	Female	188	8 (4.3%)	13 (6.9%)	107 (56.9%)	60 (31.9%)	
3.	Marital status						
	Married	9	2 (22.2%)	3 (33.3%)	4 (44.4%)	0	$\chi^2=17.20$; $p=0.001$
	Unmarried	291	14 (4.8%)	18 (6.2%)	170 (58.4%)	59 (30.6%)	

Percentages have been calculated row-wise

Table 3: Association of Quality of Internet use with demographic characteristics of study population

SN	Characteristic	Total No.	PIUQ Category			Statistical significance
			Low Problematic use (n=203)	Moderate Problematic use (n=79)	High Problematic use (n=18)	
1.	Age					
	≤25 Years	212	135 (63.7%)	68 (32.1%)	9 (4.2%)	$\chi^2=14.456$; $p=0.001$
	>25 Years	88	68 (77.3%)	11 (12.5%)	9 (10.2%)	
2.	Sex					
	Male	112	73 (65.2%)	24 (21.4%)	15 (13.4%)	$\chi^2=18.076$; $p<0.001$
	Female	188	130 (69.1%)	55 (29.3%)	3 (1.6%)	
3.	Marital status					
	Married	9	9 (100%)	-	-	$\chi^2=4.433$; $p=0.109$
	Unmarried	291	194 (66.7%)	79 (27.1%)	18 (6.2%)	

Percentages have been calculated row-wise

Table 4: Comparison of mean duration of internet use, PIUQ and IAT scores with demographic characteristics of study population

SN	Characteristic	Total No.	Internet use (hrs)	PIUQ	IAT
1.	Age				
	≤25 Years	212	4.03±1.30	49.92±12.94	70.67±16.26
	>25 Years	88	3.34±0.96	46.09±13.37	67.36±18.35
	Statistical significance	t=4.498; p<0.001	t=0.824; p=0.022	t=0.100; p=0.124	
2.	Sex				
	Male	112	3.74±1.29	50.97±14.13	68.55±17.43
	Female	188	3.87±1.22	47.49±12.40	70.38±16.65
	Statistical significance	t=0.880; p=0.380	t=-2.229; p=0.027	t=0.902; p=0.368	
3.	Marital status				
	Married	9	2.17±0.50	33.33±2.00	43.33±13.03
	Unmarried	291	3.88±1.23	49.27±13.07	70.51±16.40
	Statistical significance	t=4.147; p<0.001	t=3.652; p<0.001	t=4.922; p<0.001	

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