

# Internet Addiction and Its Association with Anxiety and Depression in Undergraduate Medical Students - A Cross-Sectional Analysis

Kumud Jain<sup>1</sup>, Sachin Wasudeorao Patil<sup>2</sup>, Priyanka Jain<sup>3</sup>

<sup>1</sup>3rd MBBS Medical Student, Community Medicine, American International Institute of Medical Sciences, Udaipur, Rajasthan,

<sup>2</sup>Professor and Head, Community Medicine, American International Institute of Medical Sciences, Udaipur, Rajasthan,

<sup>3</sup>Assistant Professor, Department of Education, Vidya Bhawan Gandhian Institute of Educational Studies Ramgiri, Badgaon, Udaipur, Rajasthan

Corresponding Author: Kumud Jain  
ORCID ID: 0009-0003-2088-2282

DOI: <https://doi.org/10.52403/ijhsr.20251231>

## ABSTRACT

**Introduction:** The advent of the internet has undeniably revolutionized modern society, transforming how we communicate, access information, and conduct daily activities. The number of active internet users worldwide exceeds 2.5 billion, the majority being adolescents and young adults. In India, the surge is even more remarkable, with around 751.5 million users. The demanding nature of medical education requires focused study and effective time management, making the integration of the internet into medical practice indispensable. However, overuse or the misuse of internet (internet addiction) can lead to procrastination, reduced academic performance, and heightened stress levels, which are particularly detrimental in a field that requires precision and continuous learning.

**Materials and Methods:** A cross-sectional analytical study was carried out among 1st, 2nd and 3rd MBBS professional years undergraduate medical students. The present study assesses the prevalence of Internet addiction and Young's Internet Addiction and the DASS-21 scale was used to evaluate depression, anxiety, and stress.

**Results:** 127 responders (48.74%) were found addicted to the internet, 48.5% were females and 135 (51.5%) males. Students spent maximum time on social media. 92% participants also reported to use the internet for educational purposes with mostly (61.5%) spending around 1-3 hours for it. The majority of participants (56.9%) mentioned using 1-3 Gb/day with monthly expenses for data (37.4%) being 300-500 Indian rupees.

**Conclusion:** This study demonstrates a high prevalence of Internet addiction among medical students and a significant positive correlation between Internet addiction and depression, anxiety, and stress. These findings emphasize the urgent need for structured mental health support and awareness programs aimed at promoting balanced Internet use.

**Keywords:** Internet addiction, medical students, medical education, internet users.

## INTRODUCTION

The advent of the internet has undeniably revolutionized modern society, transforming how we communicate, access information,

and conduct daily activities. Since its inception, the internet has evolved from a niche technology into an indispensable global network, influencing various facets of

human life. The exponential growth of internet usage is evident from current statistics with the number of active internet users worldwide exceeding 2.5 billion, majority being the adolescents and young adults.<sup>1,2,3</sup>

In 2024, Southern Asia accounts for approximately 1.1 billion internet users. In India, the surge is even more remarkable, with around 751.5 million users, i.e. over 52% of the population is now connected. Notably, 32.2% of India's population engages with social media platforms, highlighting the internet's pervasive influence on social interactions and information dissemination.<sup>4</sup>

For medical students, the internet is more than just an educational tool, it is a lifeline.<sup>5</sup> With rapid pace of medical advancements, online resources such as digital libraries, clinical databases, and up-to-date research journals are vital for keeping pace with new developments in healthcare. A study revealed that 58% of medical students favored electronic resources and used various websites and tools for medical information.<sup>6</sup> The ramifications of internet addiction are profound, affecting both mental and physical health.<sup>7</sup> Mentally, individuals may experience increased anxiety, depression, and stress.<sup>8</sup> The constant need for online engagement can lead to disrupted sleep patterns, reduced attention spans, and impaired cognitive functions.<sup>9</sup> Physically, prolonged screen time is associated with sedentary behavior, leading to issues such as eye strain, headaches, and musculoskeletal problems.<sup>10</sup>

The demanding nature of medical education requires focused study and effective time management, making the integration of the internet into medical practice indispensable. This transformation is visible in the expansion of telemedicine and the application of evidence-based approaches.<sup>11</sup> However overuse or the misuse of internet (internet addiction) can lead to procrastination, reduced academic performance, and heightened stress levels, which are particularly detrimental in a field

that requires precision and continuous learning.<sup>6</sup> Furthermore, undergraduate medical students who are already susceptible to depression may experience compromised psychological well-being due to internet addiction and poor sleep quality.

These challenges can adversely affect their behavior; impede learning, and ultimately impact the quality of patient care.<sup>12</sup> In light of these multifaceted impacts, it becomes imperative to explore the phenomenon of internet addiction among medical students. This research aims to assess the prevalence of internet addiction within this population and evaluate its effects on mental health. The main objective of this study is to assess prevalence of Internet addiction in undergraduate medical students and to associate severity of internet addiction with stress, anxiety and depression.

## **MATERIALS & METHODS**

A cross-sectional analytical study was carried out among 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> MBBS professional years undergraduate medical students at the department of community medicine attached to tertiary care medical college and hospital, American international institute of medical sciences, Udaipur. Post approvals of the Institutional ethical committee, a total number of 262 students were included in study with their consent. The study period was 4 months from July 2025 to October 2025.

### **Study Tools**

A predesigned pretested questionnaire containing information on socio demographic variables such as age, gender, academic year, residence etc. Other information like average daily data usage, monthly expenses on internet connection and total screen time were included.

IAT by Dr. Kimberly Young<sup>13-15</sup> - The data for internet addiction is collected using this scale developed by Dr Young to evaluate the levels of internet addiction. It's a self-rated scale with 20 items, 6-point Likert scale with scores ranging from 0 to 5 for each item. This measures the severity of internet use. A total

score after the sum of 20 items ranges from 0 to 100. The higher the score, the more the level of internet addiction. A score of <20 represents normal users, between 20 - 49 mild addiction, 50 - 79 Moderate addiction and 80 - 100 severe addiction.

Depression, Anxiety and stress scale (DASS)<sup>16</sup> - a 42-item questionnaire which includes 3 self-rated scales was used to assess the levels of depression, anxiety and stress. Each of the 3 scales contains 14 items and each item is rated on a 4-point scale with 0 - does not apply to me at all and 3 - applied to me very much, or most of the time.

### Inclusion Criteria

- ❖ All students willing to participate and give consent will be included in the study.
- ❖ Only a completely filled questionnaire will be included in the study.

### Exclusion Criteria

- Student's not willing or not giving consent for study participation.

- Students who do not complete the proforma will also be excluded from study.

### Data management and statistical analysis

The collected responses were exported to Microsoft Excel for data management and analysis. Data were cleaned, organized, and tabulated using Excel formulas to calculate frequencies and percentages for demographic variables. Descriptive statistics were used to summarize the socio-demographic characteristics and levels of Internet addiction.

The association between Internet addiction and various socio-demographic variables, as well as psychological parameters such as depression, anxiety, and stress, was assessed using the Chi-square test. A p-value of less than 0.05 was considered statistically significant.

### RESULT

The study was conducted at the American international institute of medical sciences where in total 262 undergraduate medical students of 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> professional year were surveyed.

**Table 1: Association of socio demographic factors with internet addiction (n=262)**

Variables		Internet Addiction		Total	p-value
		No Addiction N (%)	Addiction N (%)		
Gender	Male	64 (47.4%)	71 (52.6%)	135 (51.5%)	0.176
	Female	71 (55.9%)	56 (44.1%)		
Age group	18-19	28 (40.6%)	41 (59.4%)	69 (26.3%)	0.03
	20-21	85 (62%)	52 (38%)		
	22-24	22 (39.3%)	34 (60.7%)		
Academic Year	1st year	74 (56.5%)	57 (43.5%)	131 (50%)	0.138
	2nd year	18 (34%)	35 (66%)		
	3rd year	43 (55.1%)	35 (44.9%)		
Residence	Home	25 (46.3%)	29 (53.7%)	54 (20.6%)	0.042
	Hostel	103 (55.7%)	82 (44.3%)		
	PG / Rented	7 (30.4%)	16 (69.6%)		
Relationship status	In Relationship	9 (30%)	21 (70%)	30 (11.5%)	0.018
	Single	126 (54.3%)	106 (45.7%)		
Average Daily data usage	1-3 GB	110 (54.5%)	92 (45.5%)	202 (77.1%)	0.153
	3 - 5 GB	15 (45.5%)	18 (54.5%)		
	5+ GB	10 (37%)	17 (63%)		
Monthly expense on data	< 300	49 (64.5%)	27 (35.5%)	76 (29%)	0.018
	300-500	50 (51%)	48 (49%)		
	500-100	14 (51.9%)	13 (48.1%)		
	1000+	22 (36.1%)	39 (63.9%)		

Total screen time	< 3 hr	29 (70.7%)	12 (29.3%)	41 (15.6%)	0.00003
	3 - 5 hr	54 (54%)	46 (46%)	100 (38.2%)	
	5 - 8 hr	47 (52.2%)	43 (47.8%)	90 (34.4%)	
	8 - 12 hr	5 (20.8%)	19 (79.2%)	24 (9.2%)	
	12+ hours	0 (0%)	7 (100%)	7 (2.7%)	

Based on Young's internet addiction scale for evaluation, 127 responders (48.74%) were found addicted to the internet. Among these, 127 responders addicted to the internet (48.5%) were females and 135 (51.5%) males with almost equal percentage of each being internet addicted. Most subjects were in 20–21-year age groups with mean age of participants were  $20.43 \pm 1.39m$ , the age ranges between 18 - 24 years. Academic year wise maximum number of subjects belonged to 1<sup>st</sup> MBBS professional year - 50%. In accommodation majorly stayed at hostel - 70.6% and relationship Status of maximum were single - 87%. Devices used by students for using the internet were mostly smart phones (59%) as given in graph 1. The majority of participants (38.3%) reported spending 3-5 hours on the internet, closely

followed by a 5-8 hours slot (34.1%) daily. Students spent maximum time on social media (chatting/scrolling). 92% participants also reported to use the internet for educational purposes with mostly (61.5%) spending around 1-3 hours for it. For daily data usage, the majority of participants (56.9%) mentioned using 1-3 Gb/day with monthly expenses for data (37.4%) being 300-500 Indian rupees. After evaluating each variable on chi square test ( $p < 0.05$ ) - Age group, residence were statistically significant; relationship status and monthly expenses on internet were equally and significant ( $p = 0.018$ ) and total screen time to be highly significant and associated factors with internet addiction ( $p = 0.00003$ ) (Table - 1).

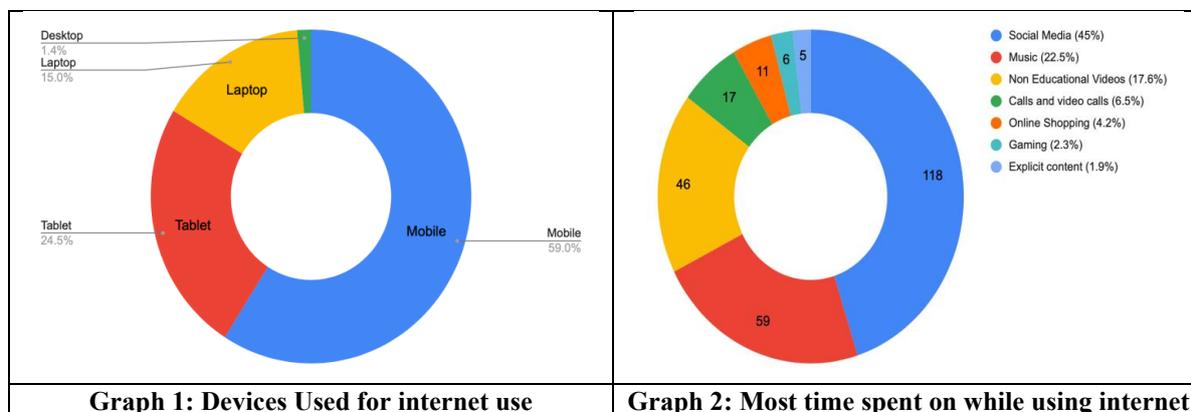


Table 2: Association of depression, Anxiety and stress with Internet addiction

Depression	Internet Addiction				P value
	No Addiction	Mild	Moderate	Severe	
	N (%)	N (%)	N (%)	N (%)	
Normal	89 (69.5%)	32 (25%)	6 (4.7%)	1 (0.8%)	
Mild	15 (41.7%)	15 (41.7%)	6 (16.7%)	0 (0%)	
Moderate	20 (33.3%)	32 (53.3%)	8 (13.3%)	0 (0%)	
Severe	6 (35.3%)	7 (41.2%)	4 (23.5%)	0 (0%)	
Extremely Severe	5 (23.8%)	6 (28.6%)	9 (42.9%)	1 (4.8%)	
Anxiety	Internet Addiction				P value
	No Addiction	Mild	Moderate	Severe	
	N (%)	N (%)	N (%)	N (%)	
Normal	73 (70.9%)	23 (22.3%)	6 (5.8%)	1 (1%)	0.0000006
Mild	10 (52.6%)	7 (36.8%)	2 (10.5%)	0 (0%)	
Moderate	27 (40.9%)	29 (43.9%)	10 (15.2%)	0 (0%)	

Severe	10 (43.5%)	13 (56.5%)	0 (0%)	0 (0%)	
Extremely Severe	15 (29.4%)	20 (39.2%)	15 (29.4%)	1 (2%)	
<b>Stress</b>					
Normal	112 (61.9%)	56 (30.9%)	12 (6.6%)	1 (0.6%)	0.0000005
Mild	9 (31%)	13 (44.8%)	7 (24.1%)	0 (0%)	
Moderate	14 (35.9%)	18 (46.2%)	7 (17.9%)	0 (0%)	
Severe	0 (0%)	4 (50%)	4 (50%)	0 (0%)	
Extremely Severe	0 (0%)	1 (20%)	3 (60%)	1 (20%)	

For the correlation of mental health with internet addiction, DASS 21 scale was used to measure the degree of stress, anxiety and depression in participants (n = 262). On evaluation, a highly significant relation was found between all the three emotional markers - depression, anxiety and stress with Internet addiction on chi square test (p<0.05). Statistically for depression correlated to internet addiction - p value came to be 0.0000003, for anxiety correlated to internet addiction- p value came 0.0000006 and for stress correlated to internet addiction - p value came 0.0000005 (Table 2).

Other statistical analysis and interpretation are as follow:

#### Depression correlation-

Total Addicts with depression - 88 (33.59%)  
 Total Addicts without depression - 39 (14.88%)  
 Total non-addicts with depression - 46 (17.56%)  
 Total non-addicts + Not depressed - 89 (33.97%)

#### Anxiety correlation -

Total Addicts with anxiety - 97 (37.02%)  
 Total Addicts without anxiety - 30 (11.45%)  
 Total non-addicts with anxiety - 62 (23.66%)  
 Total non-addict + without anxiety - 73 (27.86%)

#### Stress correlation -

Total Addicts with stress - 58 (22.14%)  
 Total Addicts without stress - 69 (26.33%)  
 Total non-addicts with stress - 23 (8.78%)  
 Total non-addict + not stressed - 112 (42.75%)

## DISCUSSION

The present study aimed to assess the prevalence of Internet addiction among undergraduate medical students and to evaluate its correlation with depression, anxiety, and stress using Young's Internet Addiction Test and the DASS-21 scale.

Among the 262 participants included, nearly half (48.74%) were found to have some degree of Internet addiction. On further division, 92 (35.11%) had mild, 33 (12.6%) had moderate, and 2 (0.76%) had severe Internet addiction. The observed prevalence is comparable to findings from similar studies conducted among medical students; for instance, a study from a medical college in Iran reported a prevalence of 47% among undergraduates in 2021.<sup>17</sup> Likewise, research from a Delhi-based medical college found Internet addiction in 52% of students in 2022.<sup>18</sup> A comparable range (39–59%) was also reported by Preeti et al. (2024), Chaudhari B et al. (2015), Singh B et al. (2021), and Rao SB et al. (2024).<sup>14, 19-21</sup> These findings collectively indicate that almost half of the student population is at risk of developing problematic Internet use, a trend that appears consistent across institutions.

However, some studies have reported considerably higher prevalence rates — ranging between 70% and 90%.<sup>22-25</sup> Such differences may be due to variations in sample characteristics, screening cut-off values, academic pressure, pandemic-related factors, and post-pandemic shifts in online dependency.

The core objective of the present study, however, was to explore the association between Internet addiction and psychological distress parameters — depression, anxiety, and stress. Statistical

analysis revealed a highly significant correlation between Internet addiction and all three emotional markers ( $p < 0.05$ ), indicating that higher levels of Internet use were accompanied by higher levels of depression, anxiety, and stress among students.

Specifically, a larger proportion of Internet-addicted students were found to have depressive symptoms compared to non-addicted participants ( $p = 0.0000003$ ). This finding supports the hypothesis that excessive and uncontrolled Internet use may act both as a coping mechanism for underlying low mood and as a reinforcing factor that worsens depressive symptoms. Similarly, a strong positive association was observed between Internet addiction and anxiety levels ( $p = 0.0000006$ ), which may be attributed to compulsive online behaviors, fear of missing out (FOMO), and performance pressure often linked with prolonged digital engagement. Stress was also found to be significantly related to Internet addiction ( $p = 0.0000005$ ). Comparable trends have been reported by other studies assessing medical students, where Internet addiction scores were significantly correlated with depression, anxiety, and stress.<sup>17, 25</sup> As Javaeed A et al. (2019)<sup>26</sup> reported, a strong correlation exists between Internet addiction and depression, anxiety, and stress. Similarly, Rao SB et al. (2023),<sup>21</sup> Arzani-Birgani A et al. (2021),<sup>17</sup> Saikia AM et al. (2019),<sup>25</sup> and Suresh VC et al. (2018)<sup>24</sup> found similar associations using Young's Internet Addiction Scale and the DASS.

Overall, the results of the current study highlight a clear pattern of psychological comorbidity accompanying problematic Internet use among medical students. Given that medical training itself is academically demanding and psychologically taxing, the coexistence of Internet addiction with depression, anxiety, and stress warrants early recognition and targeted interventions. Periodic screening using validated tools such as Young's Internet Addiction Test and the DASS-21 could help identify at-risk students

and facilitate timely counselling and behavioural modification programs.

## CONCLUSION

This study demonstrates a high prevalence of Internet addiction among medical students and a significant positive correlation between Internet addiction and depression, anxiety, and stress. These findings emphasize the urgent need for structured mental health support and awareness programs aimed at promoting balanced Internet use, stress management, and psychological well-being among students pursuing demanding academic courses such as medicine.

### *Declaration by Authors*

**Ethical Approval:** Approved

**Acknowledgement:** I express my heartfelt gratitude to Dr. Sachin Wasudeorao Patil for his continuous guidance, constructive suggestions, and encouragement at every stage of this work. His mentorship played a crucial role in shaping this manuscript.

**Source of Funding:** None

**Conflict of Interest:** The authors declare no conflict of interest.

## REFERENCES

1. Internet World Stats. Internet users of the world: Distribution by world regions. 2016 Feb 27. Available from: <https://www.internetworldstats.com/stats.htm>
2. Social networking reaches nearly one in four around the world. [Internet]. June 18, 2013. Available from: <https://share.google/Q2eA7iZsyiq7hzb1>
3. Bremer J. The internet and children: advantages and disadvantages. *Child Adolesc Psychiatr Clin N Am.* 2005 Jul; 14(3):405-28. doi: 10.1016/j.chc.2005.02.003
4. We Are Social, & Hootsuite. (2024). Digital 2024: Global overview report - Data Reportal - Global Digital Insights. Available from: <https://datareportal.com/reports/digital-2024-global-overview-report>
5. Ali I., Kalsoom O., Kazmi S. A. J., Munir T. A., Qayyum Z., Akhter N., & Jan A. A. (2019). Effect of internet addiction on

- academic performance and mental health of medical students. *Journal of Bahria University Medical and Dental College*, 9(1), 48-52.
6. Egle JP, Smeenge DM, Kassem KM, Mittal VK. The internet school of medicine: use of electronic resources by medical trainees and the reliability of those resources. *J. Surg. Educ.* 2015; 72, 316–320. <http://dx.doi.org/10.1016/j.jsurg.2014.08.005>
  7. Kuss DJ, Lopez-Fernandez O. Internet addiction and problematic Internet use: A systematic review of clinical research. *World J Psychiatry.* 2016 Mar 22;6(1):143-76. doi: 10.5498/wjp. v6.i1.143. PMID: 27014605; PMCID: PMC4804263.
  8. Višnjić A, Kők K, Terzić-Šupić Z, Stanković M. Editorial: Excessive internet use and its impact on mental health. *Front Public Health.* 2024 Aug 14; 12:1473656. doi: 10.3389/fpubh.2024.1473656. PMID: 39206010; PMCID: PMC11349741.
  9. Arshad D, Joyia UM, Fatima S, Khalid N, Rishi AI, Rahim NUA, Bukhari SF, Shairwani GK, Salmaan A. The adverse impact of excessive smartphone screen-time on sleep quality among young adults: A prospective cohort. *Sleep Sci.* 2021 Jan-Mar;14(4):337-341. doi: 10.5935/1984-0063.20200114. PMID: 35087630; PMCID: PMC8776263.
  10. Kaur K, Gurnani B, Nayak S, Deori N, Kaur S, Jethani J, Singh D, Agarkar S, Hussaindeen JR, Sukhija J, Mishra D. Digital Eye Strain- A Comprehensive Review. *Ophthalmol Ther.* 2022 Oct;11(5):1655-1680. doi: 10.1007/s40123-022-00540-9. Epub 2022 Jul 9. PMID: 35809192; PMCID: PMC9434525.
  11. Brewer G, Hiscock D. Medical education and practice in the information age. *Postgrad Med J.* 2001 Jul;77(909): 425-7. doi:10.1136/pmj.77.909.425
  12. Abdulghani HM. Stress and depression among medical students: a cross-sectional study at a medical college in Saudi Arabia. *Pak J Med Sci* 2008;24(1):12-7.
  13. Young KS. *Caught in the Net: How to Recognize the Signs of Internet Addiction and a winning strategy for recovery.* New York, NY: John Wiley & Sons, Inc; 1998. p. 248.
  14. Preeti, Khan MH, Mittal S, Dhapola VS. The prevalence of internet addiction and associated factors among undergraduate medical students in government medical college, Almora. *Asian J Med Sci* 2024;15(6):42-48.
  15. Young KS. *Internet Addiction Test (IAT) Manual.* Bradford, PA: Center for Internet Addiction Recovery; 1996.
  16. Lovibond SH and Lovibond PF. *Manual for the Depression Anxiety Stress Scales.* 2nd ed. Sydney: Psychology Foundation of Australia; 1995.
  17. Arzani-Birgani A, Zarei J, Favaregh L, Ghanaatiyan E. Internet addiction, mental health, and sleep quality in students of medical sciences, Iran: A cross-sectional study. *J Edu Health Promot* 2021; 10:409.
  18. Chauhan N, Tiwari P, Ahlawat P, Singh SK, Kamble BD, Mahaur G. Internet Addiction and Sleep Quality Among Medical Students of Delhi: A New Age Epidemic. *Natl J Community Med* 2022;13(12):864-868. DOI: 10.55489/njcm.131220222488
  19. Chaudhari B, Menon P, Saldanha D, Tewari A, Bhattacharya L. Internet addiction and its determinants among medical students. *Ind Psychiatry J* 2015; 24:158-62.
  20. Singh B, Singh KK, Ansari JA. Internet addiction, sleep quality and depression among undergraduate medical students in Nepal. *Int J Health Sci Res.* 2021; 11(2): 243-250.
  21. Rao SB, Kangil SR, Shivarudrappa NK. Internet addiction among undergraduate medical students and its relationship with alexithymia, stress, anxiety, and depression in an Indian medical college: A cross-sectional study. *J Psychiatry Spectr* 2024; 3:47-52.
  22. Abbas H, Rasheed N, Mani UA, Kumar M. Internet addiction among MBBS students at a New Delhi medical college: Prevalence and determinants of a silent pandemic. *J Family Med Prim Care* 2024; 13:730-5.
  23. Subhaprada CS, Kalyani P. A cross-sectional study on internet addiction among medical students. *Int J Community Med Public Health* 2017; 4:670-4.
  24. Suresh VC, Wilma Delphine SCR, Nayok SB (2018). Evaluation of Correlation between Internet Addiction and Psychological Status among First Year Medical Students. *International Journal of Indian Psychology*, 6(2), 16-24. DIP: 18.01.003/20180602, DOI: 10.25215/0602.003

25. Saikia AM, Das J, Barman P, Bharali MD. Internet addiction and its relationships with depression, anxiety, and stress in urban adolescents of Kamrup District, Assam. *J Fam Community Med* 2019; 26:108-12. 509. doi: <https://doi.org/10.12669/pjms.35.2.169>
26. Javaeed A, Zafar MB, Iqbal M, Ghauri SK. Correlation between Internet addiction, depression, anxiety and stress among undergraduate medical students in Azad Kashmir. *Pak J Med Sci.* 2019;35(2):506-509. doi: <https://doi.org/10.12669/pjms.35.2.169>
- How to cite this article: Kumud Jain, Sachin Wasudeorao Patil, Priyanka Jain. Internet addiction and its association with anxiety and depression in undergraduate medical students - a cross-sectional analysis. *Int J Health Sci Res.* 2025; 15(12):252-259. DOI: <https://doi.org/10.52403/ijhsr.20251231>

\*\*\*\*\*