

Exploring the Digital Frontier: A study on Extent of Internet Use among Undergraduate Medical Students

Hoque MM¹, Alam MKK², Chowdhury MAU³, Khan MKA⁴, Mujahid AA⁵, Akhter N⁶

Abstract

Background: The internet is essential for social interaction, information acquisition, and entertainment. The internet has a vast amount of knowledge that is accessible with only a click. For a student of today, it is horrifying to consider academic or research activity without internet. However, the indiscriminate use of the internet by individuals, especially students, may hamper their academic performance and quality of life. This study aimed to measure the extent of internet use among undergraduate medical students. **Methods:** This cross-sectional study was performed among 926 undergraduate medical students and interns from nine medical colleges of Bangladesh, who were selected using the convenience sampling method. The extent of internet use was assessed by the duration of internet use for academic and non-academic purposes, as well as the Internet Addiction Test (IAT) developed by Kimberly Young. **Results:** This study revealed that the mean (SD) hours of internet use for academic purposes, non-academic purposes and total duration of internet use were 2.34 (± 1.991), 3.74 (± 2.413) and 6.08 (± 3.124) respectively. Additionally, 39.3%, 33%, and 2.3% of students had mild, moderate, and severe levels of internet addiction, respectively. **Conclusion:** The results of this study indicate that a substantial proportion of undergraduate medical students are spending a considerable amount of time on the internet, with a majority using it for more than 3 hours per day on average. Moreover, a significant portion of these students demonstrated varying levels of internet addiction.

Keywords: *Extent of internet use, Undergraduate medical students, Internet addiction.*

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Introduction

The internet is a fantastic tool for sharing

information, having fun, and interacting with

others. Several individuals have been able to

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benefit from it thanks to the internet. It has become a vital requirement of our society in the information and technological century we currently live in. It serves as a crucial instrument for entertainment, knowledge, and social connection.^{1,2} Currently, it seems hard to do personal, social, administrative, and intellectual activities without the internet.³ The internet's ability to provide diverse groups of individuals with infinite temporal and geographic access to a variety of information sources is one of its most important accomplishments.⁴ Depending on their educational or employment situation, students in various countries use the internet excessively.

Nowadays, unlike in the past, computers are taught in schools. They have grown up with computers and the internet. In addition to using the internet for their academic education, they also use it to improve their social lives.^{5,6} Studies have shown that, despite the internet's impressively positive effects, its abuse and excessive use can have addictive and pathological effects.⁷

Every student now spends a significant amount of time online on a smartphone or tablet.⁸ Although only a small minority of students use the internet for restricted

instructional purposes, the majority of them just keep squandering time on "non-educational sites".⁹ According to studies, how much time a student spends online for learning versus for other purposes might have a big impact on how successful he is.¹⁰

Medical students cannot resist using the internet because it has revolutionized healthcare with the rise of telemedicine and evidence-based medicine.¹¹ Due to its low cost and availability, students frequently utilize the internet to do literary searches and to find pertinent medical information.¹² Yet, doctors and educators strongly advise against excessive internet use because it might result in related medical and psychological issues.¹³ Internet addiction is becoming more prevalent among medical students around the world, and its worrying effects on their academic, psychological, and physical health are getting worse. A research conducted in Malaysia found that 36.9% of medical students were internet addicts.¹⁴ A further study conducted in China revealed a bad association between internet use and academic performance.¹⁵ The growth of knowledge, abilities, and attitude will be negatively impacted by internet addiction, as well as overall academic achievement.

Medical students will eventually be the major healthcare providers, therefore if they develop internet addictions, it could have additional negative effects. Also, it might harm their professional development, way of life, and personality as doctors. It is vital to look into the pattern, prevalence, severity, and associated issues caused by internet addiction among Bangladeshi undergraduate medical students given the mounting anecdotal evidence about the excessive use of the internet by medical students.

Methodology

This study cross-sectional descriptive study was conducted from July 01, 2022 to June 30, 2023 (01 year) after approval from Institutional Review Board (IRB) of Centre for Medical Education (CME) as a part of thesis of Masters in Medical Education (MMEd) under Bangabandhu Sheikh Mujib Medical University (BSMMU). Data were collected from purposively selected 926 undergraduate medical students and interns from conveniently selected nine medical colleges of Bangladesh after getting permission from concerned authorities and respondents. Their responses regarding extent of internet use were collected in a self-

administered semi structured questionnaire. The questionnaires were distributed to the undergraduate medical students and interns and were collected with responses face to face. Data was manually checked and edited after collection, and then processed and analyzed by using Statistical Package for Social Science Version 25 (SPSS-25).

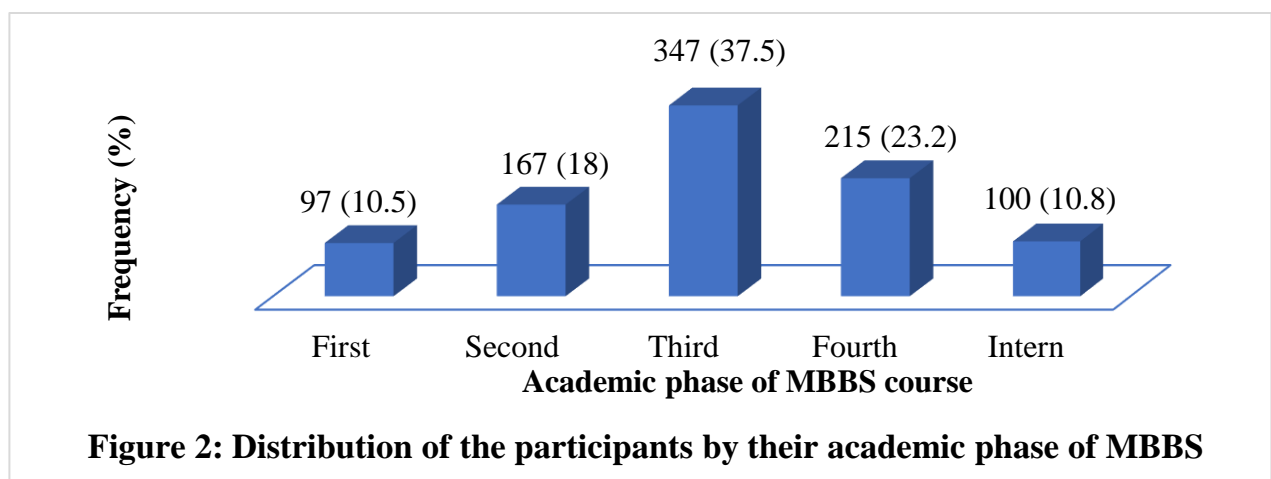
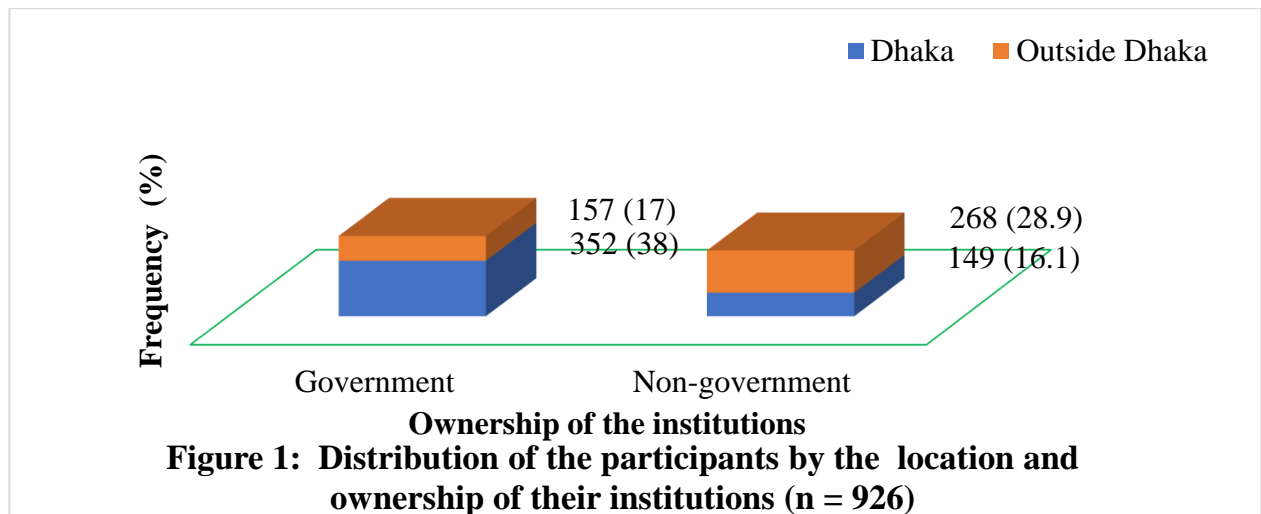
To achieve the purpose of the present study, the instrument is divided into three sections. First section consists of background information of participants. Second section was used to assess the duration of internet use by students. Third section of the questionnaire was used to measure the level of internet addiction by Internet Addiction Test (IAT) of Young. IAT is a self-rated questionnaire that contains 20 items, each item was scored in scale from 0 (0=Not applicable) to 5 (5=Always). Total internet addiction score was calculated with possible scores for the sum of the 20 items ranging between 0 and 100. Total score range from 0 to 30 points was considered as normal level of internet use; scores of 31 to 49 considered as mild level of internet addiction; 50 to 79 considered as moderate level of internet addiction; and scores of 80 to 100 considered as a severe form of internet addiction.¹⁶

Bangla translation has been used along with English language in the IAT questionnaire sections so that students can easily understand them.

4. Results

This study found that out of 926 participants, 56.3% were female and 43.7% were male. And they belonged to first (10.5%), second (18%), third (37.5%) and fourth (23.2%)

academic phase of MBBS course, and 10.8% belonged to internship training phase (Figure 2). The participants were from both government (55%) and non-government (45%) medical institutes, and they were studying/working at Dhaka (54.1%) and outside of Dhaka (45.9%) (Figure 1). The participants had different categories of marital and living status.



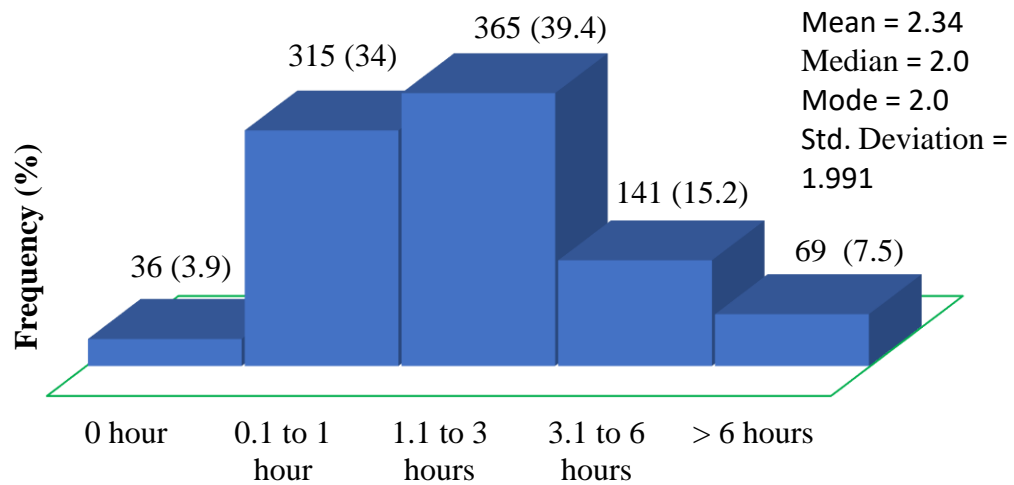


Figure 3: Distribution of participants by their duration of internet use for academic purpose (n=926)

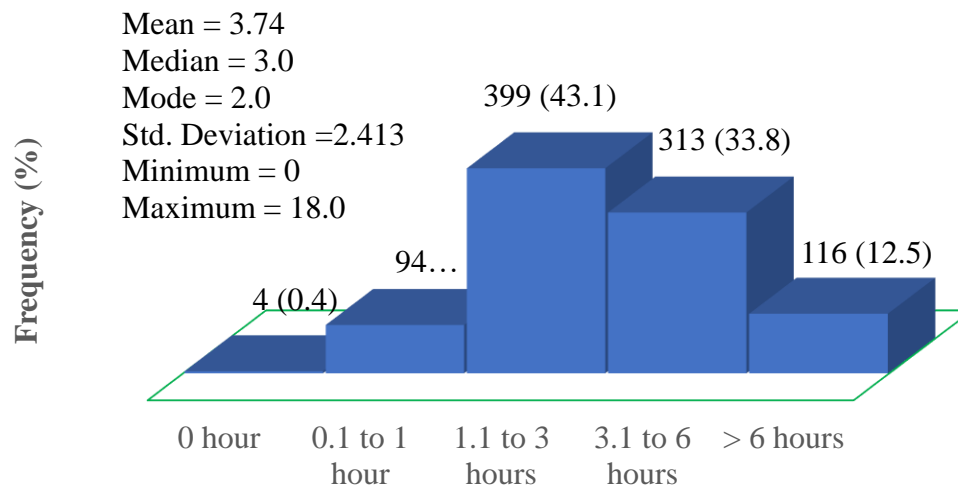
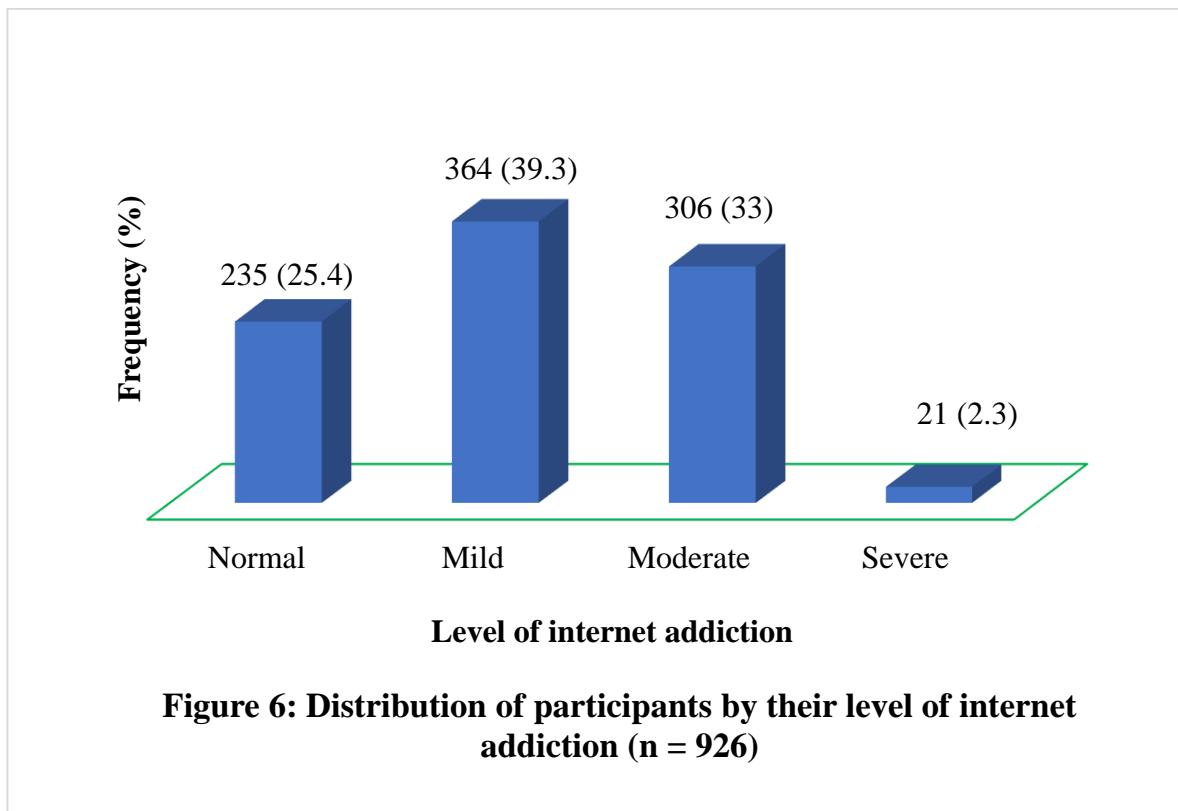
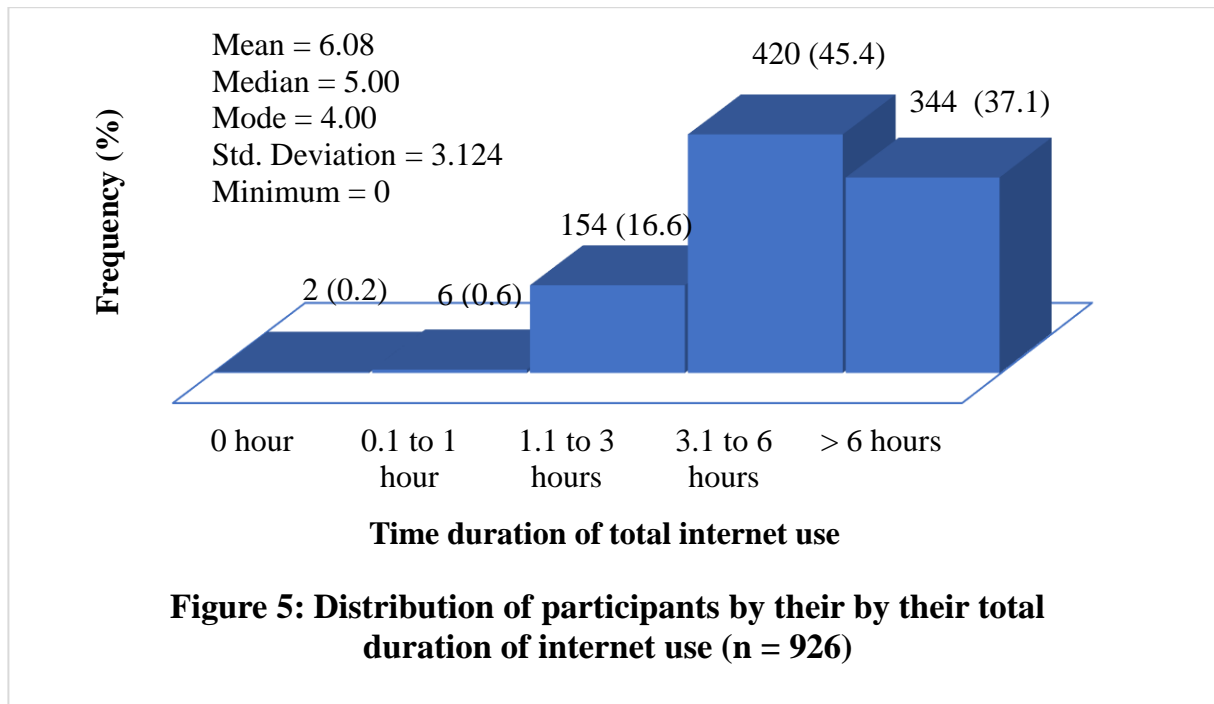


Figure 4: Distribution of the participants by their duration of internet use for non-academic purpose (n=926)



5. Discussion

This study was carried out among 926 undergraduate medical students from 1st year to intern of nine different medical colleges. Maximum students (347) were from third phase and minimum (97) students from first phase (Figure 2). Among them, 521 (56.1%) were female and 405 (43.7%) were male.

Out of nine, three government and two non-government medical colleges was located in Dhaka, and another two government and two non-government medical colleges was located outside of Dhaka. Among them, 509 (55%) students were studying at government-owned medical colleges; out of which 352 (38%) studying at the colleges located in Dhaka and 157 (17%) located outside of Dhaka. In contrast, there are 417 (45%) students were from non-governmental institutes, with 149 (16.1%) located in Dhaka and 268 (28.9%) located outside of Dhaka. (Figure 1)

The marital students of the students were unmarried 842 (91%), married 82 (8.9%) and divorced 1 (0.1%). Among the total number of students, 669 (72.3%) live with roommate, while 200 (21.6%) live with their family and 56 (6.1%) live alone.

In this study (Figure 3), the majority (39.4%) spend between 1.1 to 3 hours on the internet, followed by 34% spending between 0.1 to 1 hour for academic purpose. A smaller percentage of students spend between 3.1 to 6 hours (15.2%), while only 7.5% dedicate more than 6 hours to academic internet use. Interestingly, a small portion (3.9%) reported not using the internet for academic purposes at all. The mean time duration of internet use for academic purposes is 2.34 hours, with a median and mode of 2 hours. The standard deviation is 1.991, indicating some variation in the time durations reported. The minimum reported time is 0 hours, while the maximum is 14 hours. Numerous studies have highlighted the significance of the internet for academic purposes in modern education. The internet provides access to vast amounts of information, facilitates communication and collaboration, and offers diverse learning resources. Comparing the findings to similar articles, a study conducted by Smith and Anderson examined internet usage patterns among college students. Their results showed that the majority of students spent around 2 to 3 hours on the internet for academic purposes, which aligns with the current

study's findings.¹⁷ However, their study also revealed a higher percentage of students (20%) spending more than 6 hours online for academic activities, suggesting that the current study's sample may have a more balanced distribution of internet usage durations.

In this study (Figure 4), among 926 students, the majority of students (43.1%) reported spending between 1.1 to 3 hours per day on the internet for non-academic purposes. This suggests that a significant portion of students allocate a considerable amount of time to online leisure activities and entertainment. This indicates a common trend of devoting a substantial portion of time to online non-academic activities among students. Furthermore, 33.8% of respondents in our study reported spending between 3.1 to 6 hours per day on non-academic internet use. This suggests a significant number of students engage in longer periods of online leisure activities, which is consistent with the findings of Brown et al. (2022), who reported a comparable proportion (35%) of students spending 3 to 6 hours per day. These results highlight the prevalence of extended internet use for non-academic purposes among students.¹⁸ Interestingly, 12.5% of

respondents reported spending more than 6 hours per day on the internet for non-academic purposes. This finding emphasizes a minority group of students who engage in extensive online leisure activities. It is worth noting that only a small proportion (0.4%) of respondents in our study reported not using the internet for non-academic purposes at all. This finding is consistent with the study by Fernandez-Villa et al. (2015), who similarly reported a small percentage (0.5%) of non-users.⁹ However, the prevalence of non-users may vary across different studies, indicating the influence of sample characteristics and cultural factors. The mean time duration of internet use for non-academic purposes reported by the respondents was 3.74 hours, with a standard deviation of 2.413. This indicates a considerable variation in the reported time durations, suggesting diverse patterns of internet usage for leisure and entertainment among students. In conclusion, the findings of this study highlight the significant amount of time students spend on the internet for non-academic purposes. These patterns align with previous research, indicating a consistent trend of extensive online engagement for leisure activities.

According to this study (Figure 5), the

majority of respondents (45.4%) reported using the internet for a duration of 3.1 to 6 hours per day. This suggests that a significant proportion of students allocate a considerable amount of time to internet usage across various activities, including both academic and non-academic purposes. This finding aligns with a study conducted by Johnson, where they reported a similar proportion (47%) of students spending 3 to 6 hours per day on internet use.¹⁹ Another study carried out in Malaysia showed that the students spent a median of four hours per day on internet.¹⁴ This indicates a common trend of devoting a substantial portion of time to online activities among students. Furthermore, 37.1% of respondents in our study reported using the internet for more than 6 hours per day. This indicates a significant number of students who engage in extensive internet usage, surpassing the traditional boundaries of moderate usage. Comparatively, Brown et al. reported a slightly lower proportion (34%) of students spending over 6 hours per day.¹⁸ These results highlight the prevalence of prolonged internet use among students. It is worth noting that only a small proportion (0.2%) of respondents in our study reported not using

the internet at all. This finding is consistent with the study by Fernandez-Villa et al. (2015), who similarly reported a small percentage (0.3%) of non-users. However, the prevalence of non-users may vary across different studies, influenced by sample characteristics, technological access, and cultural factors. The mean time duration of internet use reported by the respondents was 6.08 hours per day, with a standard deviation of 3.124. This indicates a considerable variation in the reported time durations, suggesting diverse patterns of internet usage among students. The median duration of 5 hours per day and the mode of 4 hours per day further emphasize the concentration of students around these time durations. Comparatively, Ching et al. (2017) reported a median of four hours is spent by the students.¹⁴ In conclusion, the findings of this study indicate that a substantial proportion of students dedicate a significant amount of time to internet use, with a considerable number engaging in prolonged usage. These patterns align with previous research, indicating a consistent trend of extensive internet engagement among students. The current study (Figure 6) showed that the highest percentage (39.3%) of students were

found to have mild internet addiction, scoring between 31 to 49 out of 100 on the addiction scale. This suggests that a significant proportion of students exhibit some degree of addictive behaviors related to their internet use. This finding is slightly higher with a study conducted by Ahmed et al. (2019), where they reported a prevalence (23.1%) of mild internet addiction among students.²⁰ This indicates a slightly increasing trend of mild internet addiction among the student population. Furthermore, 33% of the respondents in our study were classified as having moderate internet addiction, scoring between 50 to 79 out of 100 on the addiction scale. This signifies a notable portion of students demonstrating more significant addictive behaviors associated with their internet use. A comparable proportion (35.5%) of students with moderate internet addiction was reported by Asokan et al. (2019) in their study, indicating similarities in the prevalence of moderate addiction across different samples.²¹ Interestingly, a relatively low percentage (2.3%) of respondents were classified as having severe internet addiction, scoring between 80 to 100 out of 100 on the addiction scale. This suggests a smaller but still concerning group

of students exhibiting intense addictive behaviors related to their internet use. A study by Asokan et al. (2019) reported a slightly higher percentage (0.8%) of severe internet addiction among students, suggesting some variability in the prevalence of severe addiction across studies.²¹ Only 25.4% of the total students in our study reported not having any level of internet addiction. This indicates that the majority of students exhibit at least mild addictive behaviors related to their internet use. Comparatively, a study by Pan et al. (2020) reported a similar percentage (26%) of non-addicted individuals among students, implying some consistency in the proportion of non-addicted students across different samples.²² In conclusion, the findings of this study highlight the prevalence of internet addiction among students, with a significant proportion exhibiting mild to moderate addictive behaviors. While the percentage of severe addiction is relatively low, it is still a cause for concern. These findings are consistent with previous research, indicating a consistent pattern of internet addiction among the student population.

Conclusion

Based on the findings of the present study, it

can be concluded that a majority of medical students (82.5%) used internet 3.1 to 6 hours per day on average. Among these students, 74.6% displayed varying levels (mild/moderate /sever) of internet addiction. These findings emphasize the significant role of the internet in students' lives, both academically and recreationally, and the importance of addressing internet addiction concerns among this population.

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References

1. Tarashoki EB, Beiranvand R, Mehranfard S, Majin SA, Pelarak F, Madmoli Y, Davoodi S, Najarian M. Relationship between Internet addiction and feelings of happiness at Dezful University of Medical Sciences. *Iran J Nurs Res.* 2017;12(1):9-23.
2. Karimi Johani R, Imani Zeratkar S, Abbasi N. Survey of Internet Addiction among Paramedical Students of Islamic Azad University of Urmia. *Pajouhan Scientific Journal.* 2020 Sep 10;19(1):32-7.
3. Ibrahim RA, Shalaby AS, Hegazy NN. Internet Addiction in Relation to Mental Health among Medical Students, Menoufia University, Egypt. *The Egyptian Journal of Bangladesh Journal of Medical Education* 2024; 15(1); Hoque. et al., publisher and licensee Association for Medical Education. This is an Open Access article which permits unrestricted non-commercial use, provided the original work is properly cited.
4. Soltani E, Baghaiefard H. Evaluating the Relationship between Internet Addiction with Social Interactions Anxiety and Coping Strategies among Shiraz Medical Science University Students in 2018-2019.
5. Young KS. Caught in the net: How to recognize the signs of internet addiction--and a winning strategy for recovery. John Wiley & Sons; 1998 Feb 27.
6. Chong Guan N, Isa SM, Hashim AH, Pillai SK, Harbajan Singh MK. Validity of the Malay version of the Internet Addiction Test: A study on a group of medical students in Malaysia. *Asia Pacific Journal of Public Development & Evaluation*), DGME and all the faculty members of Center for Medical Education, Dhaka for their valuable guidance throughout the entire research work and also thankful to all those who helped to complete the data collection procedures.

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Hospital Medicine. 2022 Jul 1;88(1):2325-31.

- Health. 2015 Mar;27(2):NP2210-9.
7. Widyanto L, Griffiths M. 'Internet addiction': a critical review. *International Journal of mental health and Addiction*. 2006 Jan;4:31-51.
 8. Choi SW, Kim DJ, Choi JS, Ahn H, Choi EJ, Song WY, Kim S, Youn H. Comparison of risk and protective factors associated with smartphone addiction and Internet addiction. *Journal of behavioral addictions*. 2015 Dec;4(4):308-14.
 9. Fernández-Villa T, Ojeda JA, Gómez AA, CARRAL J, CANCELA M, Delgado-Rodríguez M, García-Martín M, Jiménez-Mejías E, Llorca J, Molina AJ, Moncada RO. Problematic Internet Use in University Students: associated factors and differences of gender. *Adicciones*. 2015 Oct 1;27(4).
 10. Li Y, Zhang X, Lu F, Zhang Q, Wang Y. Internet addiction among elementary and middle school students in China: A nationally representative sample study. *Cyberpsychology, Behavior, and Social Networking*. 2014 Feb 1;17(2):111-6.
 11. Brewer G, Hiscock D. Medical education and practice in the information age. *Postgraduate Medical Journal*. 2001 Jul;77(909):425-7.
 12. Akin A, Iskender M. Internet addiction and depression, anxiety and stress. *International online journal of educational sciences*. 2011 Apr 1;3(1):138-48.
 13. Greenfield DN. Psychological characteristics of compulsive Internet use: A preliminary analysis. *Cyberpsychology & behavior*. 1999 Oct;2(5):403-12.
 14. Ching SM, Hamidin A, Vasudevan R, Sazlyna MS, Wan Aliaa WS, Foo YL, Yee A, Hoo FK. Prevalence and factors associated with internet addiction among medical students-A cross-sectional study in Malaysia. *Med J Malaysia*. 2017 Feb 1;72(1):7-11.
 15. Liu X, Bao Z, Wang Z. Internet use and Internet addiction disorder among medical students: a case from China. *Asian Social Science*. 2010 Jan 1;6(1):28-34.
 16. Young KS, De Abreu CN, editors. *Internet addiction: A handbook and guide to evaluation and treatment*. John Wiley & Sons; 2010 Oct 7.
 17. Smith A, Anderson M. *Social media use in 2018*.
 18. Brown O, Smith LG, Davidson BI, Ellis DA. The problem with the internet: An affordance-based approach for psychological research on networked technologies. *Acta Psychologica*. 2022 Aug 1;228:103650.
 19. Johnson GM. *College student internet use:*

- Convenience and amusement. Canadian Journal of Learning and Technology. 2007;33(1):n1.
20. Ahmed S, Seoty NR, Yasmin N, Khan MN. Pattern of Internet Usage and Addiction among Private Medical Colleges Students in Dhaka City, Bangladesh. Borneo Journal of Medical Sciences (BJMS). 2019 May 28;13(2):25-.
21. Asokan AG, Varghese VA, Rajeev A. Internet addiction among medical students and its impact on academic performance: an Indian study. J Med Sci Clin Res. 2019;7(3):670-6.
22. Pan YC, Chiu YC, Lin YH. Systematic review and meta-analysis of epidemiology of internet addiction. Neuroscience & Biobehavioral Reviews. 2020 Nov 1;118:612-22.