Prevalence and determinants of Internet addiction among the students of professional colleges in the Jammu region

Rashmi Kumari¹, Bhavna Langer¹, Riya Gupta², Rajiv K. Gupta¹, Mehak T. Mir¹, Basrat Shafi¹, Taswinder Kour¹, Sunil K. Raina³

Departments of ¹Community Medicine and ²Ophthalmology, GMC, Jammu, Jammu and Kashmir, ³Department of Community Medicine, RPGMC, Tanda, Himachal Pradesh, India

Abstract

Background: With ever-increasing digitization, the internet has intertwined into the daily lives of users to a large extent. It holds tremendous educational benefits to college students; however, its excessive usage can lead to addiction and even psychological morbidities. Objectives: To determine the prevalence of internet addiction and its association with various factors including depression, anxiety, and stress. Materials and Methods: A cross-sectional study was conducted among undergraduate students of two professional colleges, i.e., medical and engineering colleges in the Jammu region. A pre-tested, semi-structured questionnaire was used to elicit the information regarding socio-demographic and personal details of students. Young’s internet addiction scale was used to assess internet addiction, whereas the DASS 42 scale was used to measure depression, anxiety, and stress. Data thus collected were analyzed using the PSPP software. Results: A total of 480 students constituted the study population. The prevalence of internet addiction was found to be 78.7%, with a significantly higher prevalence seen among the male students in comparison to females ($P < 0.005$). A significantly positive correlation of internet addiction was found with depression, anxiety, and stress. Conclusions: Internet addiction is significantly associated with psychopathology among the respondents. In this context, there is an urgent need to develop effective strategies for the prevention of internet addiction by promoting awareness among the students.

Keywords: Internet addiction, professional students, psychological morbidities

Introduction

The internet is a widely recognized channel for information exchange, academic research, entertainment, communication, and commerce today. In recent years, explosive growth in the use of the internet has been seen worldwide. According to the Internet World Stats, the Internet users’ population worldwide had increased from 360 million (Dec 2000) to 4536 million (June 2019), showing the worldwide internet penetration rate of 58.8%.[1] In India, there were about 560 million internet users in June 2019, as compared to only 5 million in Dec 2000, depicting the rate of internet penetration to be 40.9% of the population, which represents 24.3% of internet users in Asia.[1]

Different terms associated with the concept of Internet addiction are Internet Addiction Disorder (IAD), Pathological Internet Use, Problematic Internet Use, Excessive Internet Use, and Compulsive Internet Use. Dr. Ivan Goldberg proposed the term “internet addiction” for pathological compulsive internet use in 1995.[8] Griffith considered it as a subset of behavior addiction and any behavior that meets the six “core components” of addiction, i.e., salience, mood modification, tolerance, withdrawal, conflict, and relapse.[9] Young linked excessive internet use most...
closely to pathological gambling, a disorder of impulse control in DSM IV, and adapted the DSM IV criteria in relation to internet use in the Internet Addiction Test developed by her.[4] In recent years, developing countries such as India have shown an exponential increase in internet usage. Easy accessibility and affordability of the internet have expanded its user group from computer scientists, engineers, and technicians to the general public. The Internet represents a global platform to share and distribute information all over the world at a very low cost. The use of the internet and its outcome has become a controversial issue nowadays. On the one hand, it is the most important and useful need of modern man, whereas, on the other hand, people are overly addicted to it. Research has shown that the frequent use of the internet caused a lot of psychological and mental disorders such as anxiety, depression, stress, and obsessive-compulsive disorder.

A review of the literature depicts a high prevalence of internet use in India, especially in the young population. However, the data pertaining to the use of the internet in J and K are very much limited, especially among the students pursuing professional courses. Hence, this study was conducted to determine the prevalence of internet addiction and its association with various sociodemographic factors and psychological morbidities among the students of professional colleges in the Jammu region.

Materials and Methods

A cross-sectional study was conducted among the undergraduate students of two different professional colleges, i.e., Government Medical College Jammu and Government College of Engineering and Technology, Kot Bhalwal, Jammu. The study design was reviewed and approved by the Institutional Ethics Committee, GMC, Jammu. After obtaining ethical clearance, permission to conduct the study was sought from the heads of both the institutions. Before the start of the actual study, informed consent was obtained from all the voluntary participants. An assurance was given to all the students who were willing to participate in the study that their personal information would be kept confidential. To ensure anonymity, no question about the name of the student was included in the questionnaire.

Study instrument

The tools used in the study were as follows:

A. A pre-tested, semi-structured, questionnaire containing information on sociodemographic variables such as age, gender, monthly family income, family history of depression or any family-related stress, personal history related to any substance abuse. Other information collected was pertaining to the duration of internet use, type of internet connection, time, and reasons for internet use.

B. Internet Addiction Test by Dr. Kimberly Young[4]

This is one of the most reliable scales used for evaluating the level of internet addiction. This is a self-rated scale developed for screening and measuring the levels of internet addiction and has been used extensively all over the world. It covers the degree to which internet use may affect daily routine, social life, productivity, sleep pattern, and feelings. It consists of a 20-item questionnaire scored on the Likert scale from 1 (rarely) to 5 (always). A total score <20 represents normal users, between 20 and 49 mild addiction, 50 and 79 moderate addiction, and 80 and 100 severe addiction. Cronbach’s alpha was calculated as 0.88 for this study.

C. Depression Anxiety and Stress Scale (DASS)[5]

DASS is a 42-item questionnaire that includes three self-report scales designed to measure the negative emotional states of depression, anxiety, and stress. Each of the three scales contains 14 items, with each item rated on a 4 point scale (0, does not apply to me at all and 3, does apply to me almost always). The internal consistency alpha coefficients were calculated for Depression, Anxiety, and Stress (0.90, 0.92, and 0.92, respectively).

Inclusion criteria

Apparently healthy students, who had given verbal informed consent.

Exclusion criteria

Students under medication for any psychiatric illness, absent during the study period, incompletely filled questionnaire, lack of interest, and not willing to give verbal informed consent.

Statistical analysis

Data thus collected were compiled and analyzed using the PSPP software (free open access software). Qualitative data are presented as proportions, whereas quantitative data as means with standard deviations. Univariate analysis was done by Chi-square test and analysis of variance (ANOVA). Correlations between continuous variables were calculated using Pearson’s correlation test. Multiple regression analysis was performed to find out the independent association of various factors with internet addiction. A P value < 0.05 was considered statistically significant.

Results

A total of 486 students studying in two different professional colleges voluntarily participated in the study, out of which 6 students were excluded from the analysis due to their incomplete questionnaires. For analysis purposes, 480 students were taken into consideration, among whom 300 were from the medical stream and 180 from the engineering stream. The mean age of the study participants was 20.46 ± 1.32 years, with a range of 18 to 24 years. Almost half of the students (54.2%) were males and the rest were females (45.8%). The majority of the students were using the internet for 1 to 5 years (67%), and nighttime users were comparatively more (47%). The most common mode of internet access was mobile internet (35%). The purpose of use mainly cited was educational (52%), followed by social networking (27%).
Figure 1 shows the distribution of respondents as per the severity of internet addiction. The prevalence of internet addiction was found to be 78.75%, with the majority being contributed by a mild level of addiction (56.6%). A severe degree of addiction was found only in two students (0.004%).

Table 1 shows the association of different variables with internet addiction. On analysis, it was revealed that stream of the profession, whether medical or engineering, was not significantly associated with the level of internet addiction, as an almost equal percentage of students from both the streams suffered from internet addiction (78.3% vs. 79.4%). However, a higher proportion of males suffered from addiction as compared to their female counterparts, and the association was also found to be statistically significant ($P < 0.005$). The presence of any family-related stress was another significant predictor of internet addiction. Among the personal habits, smoking was found to have a significant association with internet addiction ($P < 0.005$).

Table 2 reveals that there was a statistically significant difference in the mean scores of psychological morbidities, namely depression, anxiety, and stress among those with different levels of internet addiction, using ANOVA. Also, the correlation between the two was positive and was statistically significant ($P < 0.05$).

On multiple regression analysis, it was found that variables that have an independent significant association with internet addiction were gender, presence of any family-related stress, smoking, and the scores of depression, anxiety, and stress [Table 3].

**Discussion**

Increasing availability, wider acceptance, and exponential growth of the internet have led to an array of effects on the social and mental well-being of the users, especially young adults. The present study was a preliminary step to estimate the prevalence of internet addiction and understand the association between the severity of internet addiction and various factors including the

![Figure 1: Distribution of study population according to the severity of internet addiction as per Young's Internet Addiction Scale](image-url)

| Variable                      | Category          | Total   | No addiction | Mild addiction | Moderate addiction | Severe addiction | Chi square | Sig.  |
|-------------------------------|-------------------|---------|--------------|----------------|--------------------|------------------|------------|-------|
| Course                        | Medical           | 300     | 65 (21.6)    | 176 (58.6)     | 58 (19.3)          | 1 (0.33)        | 2.774     | 0.428 |
|                               | Engineering       | 180     | 37 (20.5)    | 96 (53.3)      | 46 (25.5)          | 1 (0.55)        | 0         |       |
| Semester                      | 2nd               | 134     | 33 (24.6)    | 73 (54.4)      | 28 (20.8)          | 0                | 0         |       |
|                               | 4th               | 132     | 20 (15.1)    | 81 (61.3)      | 29 (21.9)          | 2 (1.51)        | 10.18     | 0.336 |
|                               | 6th               | 125     | 27 (21.6)    | 68 (54.4)      | 30 (24)            | 0                | 0         |       |
|                               | 8th               | 89      | 22 (24.7)    | 50 (56.1)      | 17 (19.1)          | 0                | 0         |       |
| Gender                        | Males             | 260     | 35 (13.4)    | 152 (58.4)     | 71 (27.3)          | 2 (0.76)        | 26.54     | <0.005* |
|                               | Females           | 220     | 67 (30.4)    | 120 (54.5)     | 33 (15)            | 0                | 0         |       |
| Residence                     | Hosteller         | 195     | 39 (20)      | 106 (54.3)     | 49 (25.1)          | 1 (0.51)        | 2.44      | 0.48  |
|                               | Day Scholar       | 285     | 63 (22.1)    | 166 (58.2)     | 55 (19.2)          | 1 (0.35)        | 0         |       |
| Monthly family income         | <10,000           | 27      | 9 (33.3)     | 13 (48.1)      | 5 (18.5)           | 0                | 0         |       |
|                               | 10-25,000         | 97      | 24 (24.7)    | 56 (57.7)      | 16 (16.4)          | 1 (1.03)        | 7.68      | 0.57  |
|                               | 25-50,000         | 163     | 29 (17.7)    | 93 (57.1)      | 41 (25.1)          | 0                | 0         |       |
|                               | >50,000           | 193     | 40 (20.7)    | 110 (56.9)     | 42 (21.7)          | 1 (0.51)        | 0         |       |
| Any family-related stress     | Yes               | 357     | 62 (17.3)    | 209 (58.5)     | 84 (23.5)          | 2 (0.45)        | 0.45      |       |
|                               | No                | 123     | 40 (32.5)    | 33 (51.2)      | 20 (16.2)          | 0                | 0         |       |
| Relation with parents         | Good              | 438     | 99 (22.6)    | 247 (56.3)     | 90 (20.5)          | 2 (0.45)        | 0.45      |       |
|                               | Usual             | 40      | 3 (7.5)      | 23 (57.5)      | 14 (35)            | 0                | 0.163     |       |
|                               | Not Good          | 2       | 0            | 2 (100)        | 0                  | 0                | 0         |       |
| Family H/O depression or any  | Yes               | 52      | 10 (19.2)    | 28 (53.8)      | 14 (26.9)          | 0                | 0         |       |
| other psychiatric disorder    | No                | 428     | 92 (21.4)    | 244 (57)       | 90 (21)            | 2 (0.46)        | 1.18      | 0.76  |
| H/O alcohol consumption in    | Yes               | 17      | 0            | 11 (64.7)      | 6 (35.2)           | 0                | 0         |       |
| the past 2 weeks              | No                | 463     | 102 (22)     | 261 (56.3)     | 98 (21.1)          | 2 (0.43)        | 5.53      | 0.14  |
| H/O Smoking in the past 2     | Yes               | 22      | 1 (4.54)     | 15 (68.1)      | 16 (72.7)          | 0                | 0         |       |
| weeks                         | No                | 458     | 101 (22.05)  | 267 (58.2)     | 88 (19.2)          | 2 (0.43)        | 35.55     | <0.005* |

*Statistically significant ($P < 0.05$).
psychological morbidities among professional college students in the Jammu region.

The prevalence of internet addiction in the present study was found to be 78.7%. Mild, moderate, and severe degrees of internet addiction were found in 56.6%, 21.6%, and 0.004% of students, respectively. However, contrasting results were revealed in a study conducted in Nepal, where more than half (51.2%) of the respondents had a moderate-to-severe level of internet addiction. This variation can be explained because of the involvement of the younger age group (11–20 years) in the Nepal study. A study conducted in Kashmir by Bhat and Kawa revealed the proportion of respondents suffering from mild, moderate, and severe degrees of internet addiction to be 41.53%, 28.74%, and 30%, respectively. Goel et al. in his study reported 74.5% of the study population as moderate users, 24.8% as possible addicts, and 0.7% as addicts. Another study among medical students at a major university in Saudi Arabia has reported a prevalence of 65.21%. In contrast, Gedam et al. reported a very low prevalence of internet addiction of 19.85%. However, moderate and severe degrees of internet usage of

Table 2: Correlation of severity of internet addiction with depression, anxiety, and Stress scores

| Severity of internet addiction | Depression (mean±SD) | Anxiety (mean±SD) | Stress (mean±SD) |
|-------------------------------|----------------------|------------------|------------------|
| No addiction                  | 8.43±7.11            | 8.2±5.45         | 13.97±5.73       |
| Mild addiction                | 10.94±8.44           | 11.23±7.01       | 13.74±5.89       |
| Moderate addiction            | 12.27±7.91           | 12.9±6.65        | 16.33±6.76       |
| Severe addiction              | 10.00±11.31          | 12.0±5.66        | 25.00±9.99       |
| Mean±SD                       | 10.69±8.14           | 10.95±5.79       | 14.39±5.17       |

ANOVA

- F: 4.087, Sig. 0.007*, Pearson's correlation r: 0.162, Sig. <0.005*, <0.005*, <0.005*.

Table 3: Multiple regression analysis of internet addiction

| Variable                                      | Unstandardized coefficients | Standardized coefficient | t     | Significance (P) |
|-----------------------------------------------|------------------------------|--------------------------|-------|------------------|
| Course                                        | 2.423                        | 1.543                    | 0.072 | 1.570            | 0.117            |
| Semester                                      | 0.023                        | 0.321                    | 0.003 | 0.072            | 0.943            |
| Gender                                        | -7.338                       | 1.506                    | -0.225| -4.873           | 0.000*           |
| Residence                                     | -2.423                       | 1.441                    | -0.073| -1.681           | 0.093            |
| Monthly family income                         | 0.206                        | 0.307                    | 0.116 | 1.228            | 0.503            |
| Relation with parents                         | 0.116                        | 2.421                    | 0.002 | 0.048            | 0.962            |
| Family H/O depression or any other psychiatric disorder | 0.608                        | 2.292                    | 0.012 | 0.265            | 0.791            |
| Any family-related stress                     | -3.689                       | 1.644                    | -0.099| -2.243           | 0.025*           |
| H/O alcohol consumption in the past 2 weeks   | -5.269                       | 3.746                    | -0.060| -1.407           | 0.160            |
| H/O smoking in the past 2 weeks               | -10.074                      | 3.332                    | -0.129| -3.023           | 0.003*           |
| Stress score                                  | 0.341                        | 0.127                    | 0.129 | 2.679            | 0.008*           |
| Anxiety score                                 | 0.355                        | 0.120                    | 0.148 | 2.955            | 0.003*           |
| Depression score                              | 0.196                        | 0.089                    | 0.098 | 2.215            | 0.027*           |

*Statistically significant (P<0.05)
Limitations
Because the present study was a cross-sectional one, no causal relationship between internet addiction and psychological morbidities could be established. The selection of only two streams of college students may have led to self-selection bias, thus limiting the generalizability of the results.

Summary and Conclusions
The overall prevalence of internet addiction was found to be high (78.7%), with the almost same proportion of students being affected from both medical and engineering streams. Males were comparatively more addicted. A significant positive correlation was seen for internet addiction with depression, anxiety, and stress scores. Hence, measures should be adapted to promote awareness among students regarding the meaningful and appropriate use of the internet.

Relevance of the study
The present study has revealed that psychological morbidities show a positive correlation with internet addiction. Thus, there is an urgent need to emphasize the necessity of investigating the extent to which internet addiction can be considered as a primary or secondary disorder so that problems regarding the choice of efficient treatment can be sorted out on behalf of primary care physicians.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

References
1. Internet World Stats: Usage and Population Statistics; June 2019. Available from: http://www.internetworldstats.com/stats.htm. [Last accessed on 2021 Mar 01].
2. Goldberg I. Internet Addiction 1996. Available from: http://web.urz.uniheidelberg.de/Netzdienste/anleitung/wwwtips/8/addict.html. [Last accessed on 2021 Mar 03].
3. Mark G. Does internet and computer “addiction” exist? Some case study evidence. Cyberpsychol Behav 2000;3:211-8.
4. Young KS. Internet Addiction: The emergence of a new clinical disorder. Cyberpsychol Behav 1998;1:237-44.
5. Lovibond SH, Lovibond PF. Manual for the Depression Anxiety Stress Scales. 2nd ed. Sydney: Psychology Foundation of Australia; 1995.
6. Singh S, Shrestha S. Internet Addiction among students of selected schools of Pokhara, Nepal. J Chitwan Med Coll 2021;11:104-7.
7. Bhat SA, Kawa MH. A study of internet addiction and depression among university students. Int J Behav Res Psy chol 2015;3:105-8.
8. Goel D, Subramanyam A, Kamath R. A study on the prevalence of internet addiction and its association with psychopathology in Indian adolescents. Indian J Psychiatry 2013;55:140-3.
9. Almukhtar NM, Alsaad SM. Quality of life in medical students with internet addiction. J Family Med Prim Care 2020;9:5736-40.
10. Gedam SR, Ghosh S, Modi L, Goyal A, Mansharamani H. Study of internet addiction: Prevalence, pattern, and psychopathology among health professional undergraduates. Indian J Soc Psychiatry 2017;33:305-11.
11. Murarkar SK, Sava SN, Gothankar JS. Comparison of internet addictions and its mental effects in medical and engineering students of a private university at Pune. Int J Community Med Public Health 2020;7:918-21.
12. Jain A, Sharma R, Gaur KL, Yadav N, Sharma P, Sharma N, et al. Study of internet addiction and its association with depression and insomnia in university students. J Family Med Prim Care 2020;9:1700-6.
13. Sinha N, Sinha SK, Singh KK. A study on the prevalence of internet addiction and associated depression among medical students of a government medical college of Bihar. Indian J Appl Res 2018;8:1-2.
14. Singh HN, Singh TH, Surajkumar N, Gangmei A, et al. Prevalence of Internet addiction among medical students of JNIMS-A cross sectional study. J Evid Based Med Healthc 2020;7:3105-9.
15. Ansar F, Ali W, Zareef A, Maud N, Zahab S, Iftekhar H. Internet addiction and its relationship with Depression and academic performance: A cross-sectional study at a medical school in Pakistan. Int J Med Stud 2020;8:251-6.
16. Rabadi L, Ajlouni M, Masanmat S, Bataineh S, Batarseh G, Yessin A, et al. The relationship between Depression and internet addiction among university students in Jordan. J Addict Res Ther 2017;8:349.
17. Zenebe Y, Kunno K, Mekonnen M, Bewuket A, Birkie M, Necho M, et al. Prevalence and associated factors of internet addiction among undergraduate university students in Ethiopia: A community university-based cross-sectional study. BMC Psychol 2021;9:1-10.
18. Chaudhuri S, Dutt R, Ahmad S. Internet addiction among medical undergraduates in a medical college of West Bengal-a cross sectional study. Indian J Community Health 2019;31:371-5.
19. Panicker J, Sachdev R. Relations among loneliness, depression, anxiety, stress and problematic internet use. Int J Res Appl Nat Soc Sci 2014;2:1-10.
20. Saikia AM, Das J, Barman P, Bharali MD. Internet addiction and its relationship with depression, anxiety and stress in urban adolescents of Kamrup District, Assam. J Family Community Med 2019;26:108-12.
21. Gupta R, Taneja N, Anand T, Gupta A, Gupta R, Jha D, et al. Internet addiction, sleep quality and depressive symptoms amongst medical students in Delhi, India. Community Ment Health J 2021;57:771-6.
22. Sharma A, Sharma R. Internet addiction and psychological well-being among college students: A cross-sectional study from Central India. J Family Med Prim Care 2018;7:147-51.
23. Akin A. The relationships between internet addiction, subjective vitality, and subjective happiness. Cyberpsychol Behav Soc Netw 2012;15:404-10.