

A Study on the Problematic Internet Use in Telangana Undergraduate Medical Students

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Abstract

The proportion of problematic internet usage (PIU) varies from 7.3 to 51% globally due to population variety. The purpose of this study is to identify correlates of problematic internet use among telangana undergraduate medical students and to develop a model for distributing new courses across different internet user groups.

Material and Methods: From May 1 to June 30th, 2022, 201 medical undergraduate students at medical colleges in Telangana participated in a cross-sectional survey. Demographic data and elements affecting PIU were gathered using a semi-structured, pre-tested questionnaire. PIU was evaluated using Dr. Kimberly Young's Internet Addiction Test (IAT) instrument. In order to evaluate the correlates of PIU, binary logistic regression has been used, and step-wise discriminant analysis (DA) has been used to create a model for allocating new subjects among different groups of internet users. The statistical analysis was performed using SPSS Inc.'s (Chicago, IL) Statistical Package for Social Sciences (Trial version 27.0).

Result: PIU was present in all 41.3 percent of the individuals. However, in binary logistic regression, chatting, emotional support, and watching online adult content were significant risk factors for PIU. Univariate analysis demonstrates that internet use for emotional support, watching adult content, and gambling were significantly linked with PIU. The average and problematic internet user categories were accurately assigned to 66.2 percent of respondents by the discriminant model.

Conclusion: The foundation course of the curriculum implementation support programme (CISP) for MBBS students could include a discussion of problematic internet use and its possible negative effects.

Keywords: Problematic Internet Usage; Medical Students; Gambling; Adult Content.

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INTRODUCTION

Over the past two decades, there has been a significant increase in internet usage. Over 803 million individuals worldwide have access to the internet, according to recent statistics by global reach.¹ Numerous studies have been conducted on the advantages of the internet, which include communication, health related services, online financial transactions, trading, purchasing items, entertainment, etc.² Researchers discovered that

73% of college students used the internet at least once per day and typically logged on for 1.6 to 4.5 hours per day, particularly at night.²⁻⁵ The prevalence of problematic internet use (PIU) varies from 7.3 to 51 percent globally due to population diversity, different instruments, cut-off scores used, and different sample characteristics⁶⁻¹¹, whereas in India, it ranges from 7.45 to 19.85 percent among undergraduate medical students.

Researchers have examined the global consequences of problematic internet use (PIU) and found that PIU was linked to a variety of social and psychological issues, including academic failure, low self esteem, psychological distress, sleep deprivation, social withdrawal, poor diet, and cardiopulmonary complications.¹³⁻¹⁵ The mean scores of the SCL-90-R's four areas of anxiety, depression, paranoid ideation, and obsessive compulsive behaviour were lower in people without PIU than in people with PIU.^{16,17}

Researchers have suggested that a number of socio-demographic, individual, and internet related factors are connected to problematic internet use. Male gender^{4,18}, early years of the study course, peer influence, always logged in status, online interaction with friends, chat, watching porn, online new friendships or relationships, online shopping, average daily time spent on the internet, and internet access modalities were some of the risk factors for problematic internet use. Correlates of problematic internet use among south Indian undergraduate medical students, however, have not yet been thoroughly studied. Additionally, no studies have shown a model for forecasting problematic internet use in a new subject. With the help of a model for resource allocation, this study will evaluate the correlates of problematic internet use among telangana undergraduate medical students.

MATERIAL AND METHODS

From May 1 to June30, 2022, 201 undergraduate students from medical institutions in Telangana, India, participated in a cross-sectional study. All first-year medical students in Telangana who had used the internet at least once in the previous six months were eligible to participate in the study. People who refuse to consent are excluded.

Calculation of sample size: There were 300 students enrolled in the medical college, 100 in each cohort. The sample size was determined by assuming a population size of 300 and a prevalence of PIU of 50% at a level of 95% significance and 5% precision.

$$n = [Np (1-p)] / [(d^2 / Z^2_{1-\alpha} / 2 * (N-1) + p*(1-p)].$$

Where, n=sample size, N=population size, p =prevalence, d=precision.

The needed minimum sample size equals 169; with a 10% non-response rate, the actual minimum sample size was 188. We looked at and examined data from 201 students.

QUESTIONNAIRE DESIGN AND VALIDATION

On 20 undergraduate students, a semi-structured questionnaire was pretested. Following the pre-testing, some questions were altered. For the benefit of the respondent, certain questions' wording was improved. The open ended questions on reasons for using the internet were changed to 15 closed ended questions with the dichotomous answers "Yes" or "No" (According to the responses received), and one open ended question was added for any additional reasons for using the internet. This pre-tested survey was used to gather data on the respondents' age, gender, socioeconomic status, place of residence, year of enrollment, possession of a device (computer, laptop, mobile, tablet), and questions about their internet usage, such as where they prefer to access the internet (at home, a cybercafé, or somewhere else) and how long they have been using it, how much do you spend monthly on the internet on average? Questions about the reasons people use the internet, including: Why do you use it (for communicating with friends and family, for course work or assignments, for research on new developments or in areas of interest, for browsing, for news updates, for relaxation or recreation, for meeting new people, for chatting with others to share interests or fantasies, for time pass, for emotional support, for job searching, for adult only content, for games, for shopping, etc.)? How much time do you spend each week on websites like Whatsapp, online movies, online shopping, search engines (like Google and Bing), adult content sites, email, torrent download, duration of internet use, monthly internet spending, Snapchat, Twitter, YouTube, Facebook, newsgroups, and gaming sites, spiritual content, music/songs, and Instagram.

We evaluated PIU using the Internet Addiction Test (IAT) scale developed by Dr. Kimberly Young.²⁰ The IAT is a 20 items test that assesses the level of self reported internet compulsiveness. Each question is scored from 0 to 5 on a 6 points Likert scale: 0 = Not Applicable, 1 = Rarely, 2 = Occasional, 3 = Frequently, 4 = Often, and 5 = Always. This questionnaire has a scoring range of

0 to 100; the higher the score range, the more severe the addiction. Internet users who scored between 50 and 100 were classified as "problematic internet users," whereas those who scored between 50 and 100 were classified as "average internet users." According to the research, the Cronbach's alpha was 0.889 [95 percent confidence interval (CI) 0.884-0.895]. Low, at 0.049²¹, was the alpha's standard deviation. High internal consistency was found in the current investigation, with an alpha coefficient of 0.889 (CI 0.867-0.911).

DATA COLLECTION

We divided undergraduate students into groups based on the year they were admitted, enrolling at least 50 students from each group. We have established the standard that each class must have at least 60% of the total enrollment. Ninety percent of the current pupils were picked at random from the group using computer-generated random numbers after being given a serial number. Each admittance year student had their data collected just once. Students who were chosen at random were given a semi-structured, pre-tested questionnaire, which they were required to complete once. The participants had been given an explanation of the study's goals and purpose by the researchers. Participants were made aware that taking part is completely optional and has no bearing on their academic standing.

DATAMANAGEMENTANDSTATISTICAL ANALYSIS

We have established the standard that each class must have at least 60% of the total enrollment. Ninety percent of the current pupils were picked at random from the group using computer-generated random numbers after being given a serial number. Each admittance year student had their data collected just once. Students who were chosen at random were given a semi-structured, pre-tested questionnaire, which they were required to complete once. The participants had been given an explanation of the study's goals and purpose by the researchers. Participants were made aware that taking part is completely optional and has no bearing on their academic standing.

A discriminant function, which is a linear combination of the weightings and scores for these variables, is produced by the analysis. The maximum number of functions is equal to the smaller of either the number of predictors or

the number of groups minus one.²² Determine a regression style linear equation, such as one used in discriminant analysis, to forecast which category the case belongs to. The equation or function has the following form:

$$Z_{jk} = a + W_1X_{1k} + W_2X_{2k} + \dots + W_nX_{nk}$$

Where:

Z_{jk} = Discriminant Z score of discriminant function j for object k.

a = Intercept.

W_i = Discriminant coefficient for the Independent variable i.

X_{ik} = Independent variable i for object k.

n = number of predictor variables.

RESULTS

In the current study, we analysed the data of 201 respondents, the majority of whom were under the age of 20. About two thirds of the individuals were male, and 96% of them practised Hinduism. 76.1 percent of the individuals come from nuclear families and have upper or upper middle SES (84.6 percent). More than half of the research participants (55.7%) stayed in the hostel, 36.3 percent, 36.2 percent, and 26.9 percent of the study participants were in their second years, third years, and first years, respectively (Table 1).

Table 1: Shows the distribution of study participants' sociodemographic data (N = 201).

Variable	Frequency(%)
Age	
<20 years	59(29.4%)
>20years (20years)	142(70.6%)
Gender	
Male	132(65.7%)
Female	69(34.3%)
Religion	
Hindu	193(96%)
Muslim or Christian	8(4%)
Type of family	
Nuclear	153(76.1%)
Large	48(23.9%)
Socio economic status	
Upper and upper middle	170(84.6%)
Lower and lower middle	31(15.4%)
Hostel accommodation status	
Hostellers	112(55.7%)

Day scholars	89(44.3%)
Admissions year	
First year (2021)	54(26.9%)
Second year (2020)	73(36.3)
Third year (2019)	74(36.8%)

The internet was first used by two thirds of the survey participants in their early adolescent years. Only 11.4% of research participants used the internet for more than ten years, and the majority of participants (60.7%) only used it for six to ten years. 99% of the participants in the research owned a smart phone, whereas 51.7% owned a laptop, 31.3% owned a PC, and 24.4% owned a tablet. Only 15.4% of the participants owned every electronic device mentioned above. Ninety nine percent of the participants preferred using cell phones to access the internet. More than half (51.7%) of research participants preferred using the internet at night, while only 9% preferred using it in the morning. The majority of participants utilise the internet on a daily basis. 72.1 percent of the individuals used the internet for less than 5 hours per day, while only 6 percent used it for more than 10 hours each day. Only 10% of the survey participants had spent more than INR 500 per month on the internet, and more than half (50.7%) of the participants had spent less than INR 150 per month. 41.3 percent of study participants had PIU, and 60.7 percent were continuously logged in (Table 2).

Table 2: Shows how study participants (N = 201) typically utilise the Internet.

Variable	Frequency	Percentage
Age at first internet use		
5-10 years	32	15.9
11-15 years	133	66.2
16-20 years	36	17.9
Duration of internet use		
1-5 years	56	27.9
6-10 years	122	60.7
>10 years	23	11.4
Ownership of electronic gadget with internet access*		
Smartphone	199	99
Laptop	104	51.7
Computer	63	31.3
Tablet	49	24.4
All	31	15.4
The Most Common Mode of Internet access		
Smartphone	199	99
Computer	2	1

Internet use per week

7 days	192	95.5
2-6 days	9	4.5

Preferred time to use internet

Day (6 am to 5 pm)	18	9
Evening (5 pm-10 pm)	79	39.3
Night (10 pm-5 am)	104	51.7

Internet use Per Day

≤5 Hours	145	72.1
6-10 Hours	44	21.9
>10 Hours	12	6.0

Money spent on the internet per month

INR 1-150	102	50.7
INR 151-300	48	23.9
INR 301-500	31	15.4
INR >500	20	10

Log in status

Permanently login	122	60.7
On and off	79	39.3
Problematic internet use		
Yes	83	41.3
No	118	58.3

* MULTIPLE RESPONSE

The most common uses of the internet were found to be for job or school related purposes, friend communication, browsing, leisure or relaxation, passing the time, shopping, and news updates, accounting for 99, 98.5, 98, 97.5, 96, 92.5, and 90 percent of all usage, respectively. A little more than 21% of the subjects gambled online (Fig. 1). However, in binary logistic regression, talking,

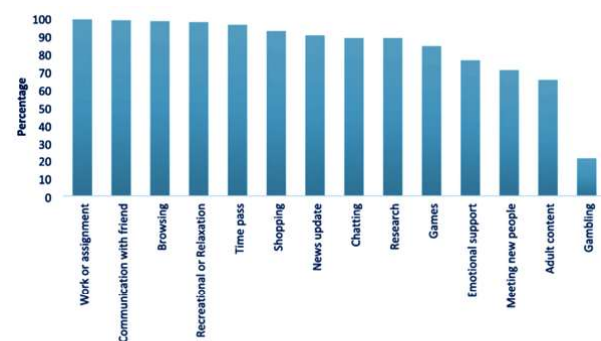


Fig. 1: Reasons of internet use among study subjects (N=201)

emotional support, and watching online adult content were found to be significant risk factors for PIU. Univariate analysis reveals that internet use for gambling, watching adult content, and emotional support were substantially related with PIU (Table 3).

Table 3: Shows the relationship between several risk variables and problematic internet use (N=201).

Variable	Average Internet users (118)	Problematic Internet users (83)	Unadjusted OR (95% CI)	Adjusted OR (95%CI)
Gender (Male)	76	56	1.15 (0.63–2.08)	0.68 (0.32–1.46)
Permanent residence (Delhi)	93	59	1.51 (0.79–2.89)	0.49 (0.21–1.10)
Hostel accommodation status (Yes)	67	45	0.90 (0.51–1.59)	0.63 (0.31–1.31)
Admission year (2016 & 2017)	85	62	1.15 (0.61–2.17)	1.352 (0.65–2.80)
Age at first internet use (>10 Years)	18	14	1.13 (0.53–2.42)	1.34 (0.55–3.28)
Preferred time of day for internet access (Evening or Night)	105	78	1.931 (0.66–5.64)	2.62 (0.78–8.86)
Work or assignment (Yes)	117	82	1.4 (0.09–23.14)	1.35 (0.06–30.16)
Communication with friend (Yes)	117	81	2.90 (0.26–32.39)	1.31 (0.08–20.98)
Browsing (Yes)	116	81	1.43 (0.20–10.38)	1.77 (0.19–16.08)
Recreational or Relaxation (Yes)	115	81	0.95 (0.16–5.79)	0.24 (0.02–3.38)
Wasting time (Yes)	112	81	0.46 (0.09–2.34)	1.14 (0.17–7.50)
Shopping (Yes)	110	76	1.27 (0.44–3.64)	1.95 (0.55–6.91)
News update (Yes)	107	74	1.18 (0.47–3.00)	0.96 (0.31,2.99)
Chatting (Yes)	106	72	1.35 (0.57–3.23)	3.44 (1.02–11.53) *
Research (Yes)	106	72	1.35 (0.565–3.23)	2.04 (0.62–6.66)
Games (Yes)	98	71	0.83 (0.38–1.80)	0.77 (0.30–1.99)
Emotional support (Yes)	81	72	0.33 (0.16–0.70) *	0.28 (0.12–0.69) *
Meeting new people (Yes)	79	63	0.64 (0.34–1.21)	0.72 (0.30–1.70)
Adult content (Yes)	69	62	0.48 (0.26–0.88) *	0.37 (0.16–0.81) *
Gambling (Yes)	19	23	0.50 (0.25–1.00) *	0.65 (0.29–1.46)

* p < 0.05

Before building the model, each independent variable's potential has been evaluated using Table 4's test of equality of group means. Each test shows the outcomes of a one-way ANOVA for the independent variable with the factor, Internet Users, as the grouping variable. The variable probably doesn't affect the model if the p-value is bigger than 0.05. Another indicator of a variable's potential is Wilks' lambda. Smaller numbers show that the variable is more effective at group separation. For just seven variables, including email time (in

minutes), shopping time (in minutes), YouTube time (in minutes), WhatsApp time (in minutes), movie time (in minutes), download time (in minutes), and educational use time, we have found strong statistical evidence of significant differences between means of average internet users and problematic internet users (in min). The distinction between typical internet users and problematic internet users cannot be made using insignificant variables (Table 4).

Table 4: Tests whether group means of the variables under study are equivalent across different types of internet users.

Variables	Wilks Lambda	F value	p-value
Age	0.995	1.096	0.296
Family Income (INR)	0.987	2.610	0.108
Amount Spent on Internet (INR)	0.997	0.570	0.451
Email time (in min)	0.972	5.651	0.018*
Tool time (in min)	0.985	3.042	0.083
Newsgroup time (in min)	0.988	2.432	0.120
Game site time (in min)	1.000	0.006	0.938
Shopping time (in min)	0.972	5.698	0.018*
You Tube time (in min)	0.977	4.607	0.033*

Music time (in min)	0.991	1.881	0.172
Facebook time (in min)	0.993	1.430	0.233
WhatsApp time (in min)	0.952	10.099	0.002*
Twitter time (in min)	0.989	2.304	0.131
Instagram time (in min)	0.995	1.001	0.318
Snapchat time (in min)	0.990	2.043	0.155
Movie time (in min)	0.971	5.883	0.016*
Download time (in min)	0.969	6.372	0.012*
Educational use time (in min)	0.972	5.733	0.018*
Spiritual time (in min)	0.992	1.664	0.199
Adult site time (in min)	0.986	2.854	0.093

* p-value<0.05

For choosing the "best" variables to utilise in the model, the step wise discriminant analysis method has been used. The step wise approach begins with a model devoid of any of the independent variables. The predictor with the largest F value to Enter an input value greater than 3.84 is added to the model at each stage. The final stage does not include adding any more variables because all of the variables excluded from the study have F to Enter values lower than 3.84. Therefore, family income, email usage, and WhatsApp usage are the last three variables chosen in the model with F to enter values > 3.84. The F value for a variable is a measurement of how significantly it contributes uniquely to the prediction of group membership,

or how statistically significant it is in distinguishing between groups.

The following is the model's equation when the variables chosen by using step-by-step discriminant analysis are taken into account.

$$D = (0.000 * \text{family income}) + (0.0076 * \text{email time}) + (0.001 * \text{Whatsapp time}) - 0.294.$$

By entering the values of these three variables into the discriminant equation above, we can calculate the discriminant scores. By comparing these scores to the cut-off value (Fig. 2), we can determine whether subjects will be placed in the group of average internet users or the group of problematic internet users.

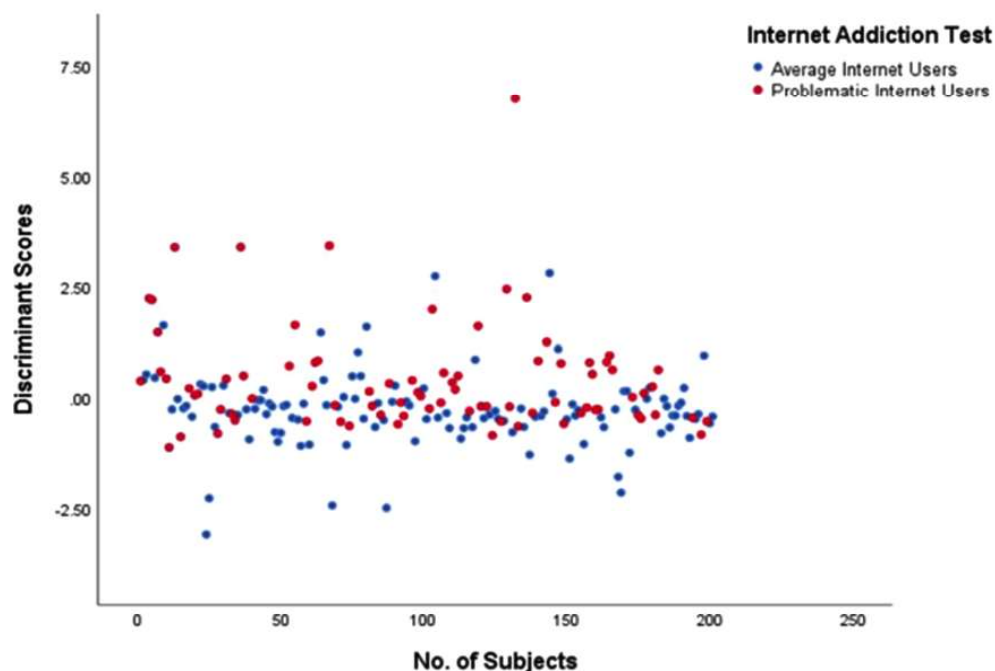


Fig. 2: R Scatter plot of discriminant scores of each subject for the model

According to Table 5, 66.2% of respondents were appropriately categorised into groups of average and problematic internet users. 92.4 percent of the participants with average internet use were properly predicted by this model.

Table 5: Shows the suggested model's classification results using a step-wise discriminant analysis model (N = 201)

Original classification	Predicted Group Membership		Total
	Average internet users(%)	Problematic internet users(%)	
Average Internet Users	109 (92.4)	9 (7.6)	118 (58.7)
Problematic Internet Users	59 (71.1)	24 (28.9)	83 (41.3)

The discriminant scores for 201 subjects are displayed in Fig. 2. While problematic internet users have a centroid value of 0.395, average internet users have one of 0.278.

The general formula for the calculation of cut off value is given by

$$Z_{cs} = NAZB + NBZANA + NBZcs = NAZB + NBZANA + NB$$

Where,

ZCS=Optimal cut - off value between groups A and B.

NA = number of observations in group A.

NB = number of observations in group B.

ZA = Centroid for group A.

ZB = Centroid for group B.

As a result, in this instance, 0.118 will be the cutoff score. Internet users who score above 0.118 are considered problematic, whereas those who score below 0.118 are considered average.

DISCUSSION

A study on medical students by Pramanik *et al.*⁹ has confirmed our findings that 41.3 percent of the subjects had PIU, although in some other studies, the PIU ranged from 5.8 to 30 percent.^{3,7, 8,12,23,24,25} However, a study by Sayyah *et al.*¹¹ indicated a significant prevalence of PIU (51 percent). The demographics of the study subjects, the majority of whom (84.6 percent) belong to upper or upper middle SES, and the increased use of the internet in big cities like Hyderabad may be the causes of the high magnitude of PIU in our study. While the majority of studies revealed that male gender was strongly related with PIU,^{2,3,6,7,23,25,28,29} we did not

find a significant relationship between gender and PIU. However, comparable findings were reported in a study conducted by other researchers.^{26,27} But according to earlier research, women were substantially more likely to have PIU.^{24,30} The fact that both male and female medical students have good access to the internet may account for the lack of a statistically significant link between gender and PIU in our study. In this study, there was no correlation between staying among a hostel and PIU; similar findings were made by Salehi *et al.*⁶ and Ghamari *et al.*³⁰, although Chaudhari *et al.*² and Anand *et al.*²⁹ reported that PIU was considerably greater in hostel dwellers than non-hostellers. The similar outcome was discovered by Chaudhari *et al.*², and we have not discovered any correlation between PIU and the year of study. While Sayyah *et al.*¹¹ discovered that PIU was significantly higher in senior students as compared to junior students, Krishnamurthy *et al.*¹² and Asiri *et al.*³¹ discovered that students in their first or second professional years had significantly higher PIU as compared to third and fourth year students. Due to the fact that medical students from all professional years share similar psychological and environmental characteristics, there was no correlation between PIU and the study year in the current study. We have not discovered any conclusive correlation between PIU and age at first internet use. However, several researchers reported that PIU students had significantly lower ages at which they initially used the internet.^{2, 28} While Gedam *et al.*³ discovered PIU was significantly higher in students whose preferred time of internet access was evening or night compared to morning or afternoon, we have found no association between PIU and a preferred time of internet use. This finding is supported by a study conducted by Salehi *et al.*⁶ Our study demonstrates that using the internet for emotional support, viewing adult content, gaming, and talking was a statistically significant risk factor for PIU. Previous studies by various researchers^{2,7,12,23,32} have supported this finding. Similar findings were found in numerous studies conducted in India and other countries as well.^{3,6,7,28} We discovered that using the internet for work or assignments, communication with friends, browsing, leisure or relaxation, wasting time, shopping, news updates, research, games, and meeting new people online were not significantly associated with PIU. Contrarily, Salehi *et al.*⁶ discovered that friend to friend communication was strongly related with PIU, and Krishnamurthy *et al.*¹² discovered that using the internet for business and establishing new acquaintances on social media were significantly

connected with PIU. The usage of the internet for shopping was substantially associated with PIU, according to a study by Mazhari.⁷ As far as we are aware, this study is the first to distinguish between groups of typical and problematic internet users. The model was created using a step wise Family income, email usage, and Whatsapp usage, according to DA, correctly classify 66.2 percent of the subjects into average and problematic internet user groups. One of the most widely used social networking platforms, Whatsapp is utilised excessively in daily life since it can be used to communicate text messages, videos, images, and work-related information.³³ The ease with which WhatsApp may be used people can check messages and respond at any time, from anywhere is a key element in its rapid adoption. One of the variables that has a direct correlation with internet use is income. Internet usage increases with income.³⁴ Medical students are increasingly using email for homework, assignments, and research related tasks. The PIU among first year medical students can be identified using these discriminators.

First, because our study was conducted in a single location, multi location studies that examine the variations in subject areas, specialties, and grade levels are recommended. Second, because our study was cross-sectional, we were unable to determine a cause and effect connection; a longitudinal study would have provided more useful information. Third, there is some recollection bias in this study. Fourth, using a person's self-report to estimate how much time they spend on various gadgets and activities is probably skewed.

CONCLUSION

According to our study, undergraduate medical students have significant PIU. Chatting, watching pornographic content online, and using the internet for emotional support were all strongly linked to PIU. The foundation course of the curriculum implementation support programme (CISP) for MBBS students might include a lesson on PIU and its potential drawbacks to raise awareness among medical students. It should be made a priority to offer kids plenty of chances to participate in extracurricular activities and socialise with peers. Due to their heavy workloads from coursework and lengthy posting schedules, medical students should have access to counsellors for emotional and mental assistance.

REFERENCES

1. Global reach (2019). Evolutions of online population. [Cited 2019 March 11th].
2. Chaudhari B, Menon P, Saldanha D, Tewari A, Bhattacharya L. Internet addiction and its determinants among medical students. *Ind Psychiatry J.* 2015;24(2):15862.
3. 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(4):305-11.
4. Scherer K. College life online: healthy and unhealthy internet use. *J Coll Stud Dev.* 1997;38:655-65.
5. Anderson K. Internet use among college students: an exploratory study. *J Am Coll Heal.* 2001;50(1):21-6.
6. Salehi M, Khalili MN, Hojjat SK, Salehi M, Danesh A. Prevalence of internet addiction and associated factors among medical students from Mashhad, Iran in 2013. *Iran Red Crescent Med J.* 2014;16(5):e17256.
7. Mazhari S. The prevalence of problematic internet use and the related factors in medical students, Kerman, Iran. *Addict Health.* 2012;4(3-4):87-94.
8. Zhang MWB, Lim RBC, Lee C, Ho RCM. Prevalence of internet addiction in medical students: a Meta-analysis. *Acad Psychiatry.* 2018;42(1):88-93.
9. Pramanik T, Sherpa MT, Shrestha R. Internet addiction in a group of medical students: a cross sectional study. *Nepal Med Coll J.* 2012;14(1):46-8.
10. Fineberg NA, Demetrovics Z, Stein DJ, Ioannidis K, Potenza MN, Grünblatt E, et al. Manifesto for a European research network into problematic usage of the internet. *Eur Neuropsychopharmacol.* 2018;28(11):1232-46. <https://doi.org/10.1016/j.euroneuro.2018.08.004>.
11. Sayyah M, Khanaferreh S. Prevalence of internet addiction among medical students: a study from southwestern Iran. *Cent Eur J Public Health.* 2019;27(4):326-9.
12. Krishnamurthy S, Chetlapalli SK. Internet addiction: prevalence and risk factors: a cross-sectional study among college students in Bengaluru, the Silicon Valley of India. *Indian J Public Health.* 2015;59(2):115-21.
13. Balhara YP, Gupta R, Atilola O, Knez R, Mohorović T, Gajdhar W, et al. Problematic internet use and its correlates among students from three medical schools across three countries. *Acad Psychiatry.* 2015;39(6):634-8.
14. Christakis DA. Internet addiction: a 21st century epidemic? *BMC Med.* 2010;8(1):61.
15. Çardak M. Psychological well-being and internet

- addiction among university students. *Turk Online J Educ Tech.* 2013;12.
16. Xiuqin H, Huimin Z, Mengchen L, Jinan W, Ying Z, Ran T. Mental health, personality, and parental rearing styles of adolescents with internet addiction disorder. *Cyberpsychol Behav Soc Netw.* 2010;13(4):401-6.
 17. Alavi SS, Alaghemandan H, Maracy MR, Jannatifard F, Eslami M, Ferdosi M. Impact of addiction to internet on a number of psychiatric symptoms in students of Isfahan universities, Iran, 2010. *Int J Prev Med.* 2012;3(2):122-7.
 18. Paul AV, Ganapathi CK, Duraimurugan M, Abirami V, Reji E. Internet addiction and associated factors: a study among college students in South India. *Innov J Med Health Sci.* 2015;5(3):121-5.
 19. Ceyhan AA. Predictors of problematic internet use on Turkish university students. *CyberPsychol Behav.* 2008;11(3):363-6.
 20. Young KS. *Internet addiction test manual.* Bradford: Center for Internet Addiction Recovery; 2007.
 21. Frangos CC, Frangos CC, Sotiropoulos I. A meta-analysis of the reliability of Young's internet addiction test. In *proceedings of the world congress on engineering 2012 Jul (Vol. 1, pp. 368-371).* London, United Kingdom: World Congress on Engineering.
 22. Ramayah T, Ahmad NH, Halim HA, Zainal SR, Lo MC. Discriminant analysis: an illustrated example. *Afr J Bus Manag.* 2010;4(9):1654-67.
 23. Kim KM, Kim H, Choi JW, Kim SY, Kim JW. What types of internet services make adolescents addicted? Correlates of problematic internet use. *Neuropsychiatr Dis Treat.* 2020;16:1031-41.
 24. Haroon MZ, Zeb Z, Javed Z, Awan Z, Aftab Z, Talat W. Internet Addiction in Medical Students. *J Ayub Med Coll Abbottabad.* 2018;30(Suppl 1):S659-63.
 25. Sharma A, Sahu R, Kasar PK, Sharma R. Internet addiction among professional courses students: a study from Central India. *Int J Med Sci Public Health.* 2014;3(9):1069-73.
 26. Ioannidis K, Chamberlain SR, Treder MS, Kiraly F, Leppink EW, Redden SA, et al. Problematic internet use (PIU): associations with the impulsive-compulsive spectrum. An application of machine learning in psychiatry. *J Psychiatr Res.* 2016;83:94-102.
 27. Mamun MA, Hossain MS, Siddique AB, Sikder MT, Kuss DJ, Griffiths MD. Problematic internet use in Bangladeshi students: the role of socio-demographic factors, depression, anxiety, and stress. *Asian J Psychiatr.* 2019;44:48-54.
 28. Ghamari F, Mohammadbeigi A, Mohammadsalehi N, Hashiani AA. Internet addiction and modeling its risk factors in medical students, Iran Indian. *J Psychol Med.* 2011;33(2):158-62.
 29. Anand N, Jain PA, Prabhu S, Thomas C, Bhat A, Prathyusha PV, et al. Internet use patterns, internet addiction, and psychological distress among engineering university students: a study from India. *Indian J Psychol Med.* 2018;40(5):458-67.
 30. Taha MH, Shehzad K, Alamro AS, Wadi M. Internet use and addiction among medical students in Qassim University, Saudi Arabia. *Sultan Qaboos Univ Med J.* 2019;19(2):e142-7.
 31. Asiri S, Fallahi F, Ghanbari A, Kazemnejad-Leili E. Internet addiction and its predictors in guilan medical sciences students, 2012. *Nurs Midwifery Stud.* 2013;2(2):234-9.
 32. Mitchell KJ, Wells M. Problematic internet experiences: primary or secondary presenting problems in persons seeking mental health care? *Soc Sci Med.* 2007;65(6):1136-41.
 33. Faye AD, Gawande S, Tadke R, Kirpekar VC, Bhavne SH. WhatsApp addiction and borderline personality disorder: a new therapeutic challenge. *Indian J Psychiatry.* 2016 Apr;58(2):235-7.
 34. Martin SP, Robinson JP. The income digital divide: trends and predictions for levels of internet use. *Soc Probl.* 2007;54(1):1-22.
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