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Internet Addiction and its Relationships with Depression, Anxiety, and Stress in Urban Adolescents of Kamrup District, Assam

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Abstract:

BACKGROUND: In these modern times of digitization, the use of Internet has become an integral part of everyday life, especially the lives of adolescents. At the same time, Internet addiction has emerged as a serious affliction. However, the impact of Internet addiction on these crucial years of life has not been well studied in India. The objective of this study was to determine the prevalence of Internet addiction in adolescents of the urban areas of Kamrup district and assess its association with depression, anxiety, and stress.

MATERIALS AND METHODS: A cross-sectional study was conducted among students of higher secondary schools/colleges in the urban areas of Kamrup district in Assam. Out of 103 government and private higher secondary school/colleges of Kamrup district, Assam, 10 colleges were selected randomly, and a total of 440 students were enrolled in the study. A pretested, predesigned questionnaire, Young's Internet Addiction Scale, and Depression Anxiety Stress Scales 21 (DASS21) were used in the study. Chi-square test and Fisher's exact test were used to assess the association between Internet addiction and depression, stress, and anxiety.

RESULTS: Majority (73.1%) of the respondents were females, and mean age was 17.21 years. The prevalence of Internet addiction was 80.7%. The main purpose of using Internet was social networking (71.4%) followed by study (42.1%), and majority (42.1%) reported spending 3-6 hours a day on internet. There was a significant association between Internet addiction and stress (odds ratio=12), depression (odds ratio=14), and anxiety (odds ratio=3.3).

CONCLUSION: Internet addiction is a serious problem with a profound impact on mental health. Therefore, early intervention is crucial.

Keywords:

Adolescents, anxiety, depression, Depression Anxiety Stress Scales 21, Internet addiction, stress, Young's Internet scale

Introduction

The Internet has become an integral and irreplaceable part of our daily lives. It has not only become an ubiquitous entity but also has literally become an indispensable modern day tool for shopping, study, research, communication, and staying in touch with family members and friends by

means of numerous applications ranging from Wikipedia to Facebook. With the rapid strides made in wireless Internet technologies such as Wi-Fi, 3G, and 4G, and the advent of cheap 3G- and 4G-enabled smartphones, the Internet has become readily accessible to individuals across all socioeconomic groups. This has resulted in the emergence of a relatively new and worrisome phenomenon called "Internet addiction," which is increasingly affecting

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adolescents and young adults. Although the term addiction is used predominantly in relation to substance abuse, many authors are now using the term addiction to denote compulsive behavioral disorders with the Internet.^[1] Currently, there is no consensus on the definition of Internet addiction.^[2] There is an ongoing debate about how best to classify the behavior, which is characterized by many hours spent in nonwork technology-related computer/Internet/video game activities.^[3,4]

Internet addiction is an impulse-control disorder like pathological disorders but does not involve an intoxicant.^[5] However, Internet addiction is not included in the latest Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V). The only behavioral addiction included in DSM-V is gaming or gambling disorder. The idea that problematic computer use meets criteria for addiction and therefore should be included in the next iteration of the DSM was first proposed by Kimberly Young in her seminal 1996 paper.^[6]

Internet addiction occurs through some neurohormonal pathways. Addictions activate a combination of sites in the brain associated with pleasure, known together as the “reward center” or “pleasure pathway” of the brain.^[7,8] When activated, dopamine release is increased, along with opiates and other neurochemicals.^[9,10]

The effect of Internet addiction on physiological and psychological health is tremendous. Various studies have reported it from time to time. The effect on psychological health in these crucial years of life definitely inhibits productivity and scholastic performances of young adults/adolescents. Understanding the issue and providing timely intervention is crucial to prevent long-lasting psychological morbidities. However, studies on Internet addiction are scarce in this part of the country. In view of this, the present study was undertaken with the following objectives: to determine the prevalence of Internet addiction in adolescents of urban areas of Kamrup district and assess the association of Internet addiction with depression, anxiety, and stress.

Materials and Methods

A cross-sectional study was conducted among students of higher secondary colleges/school in the urban areas of Kamrup district of Assam from July to October 2017. The study was approved by the Institutional Ethics Committee. Those who had been using the Internet for the past 6 months were included in the study. Informed written consent was obtained from the students as well as from the Principal.

Considering the wide variation in the prevalence of Internet addiction and limitation of available literature,

P was considered as 0.5.^[11] By using the formula $4pq/l^2$, where l was 10% of P , the calculated sample size was 400. A 10% oversampling was done to take into account an inadequate response giving a final sample size of 440.

Out of 103 colleges, 10%, i.e., 10 colleges were selected randomly. From each selected colleges, a class was selected randomly. If there was more than one stream in that institution, one was selected randomly, and if there was more than one section, one section was also selected randomly. From each selected class, the lottery method was used to select 22 students from the attendance register [Figure 1]. If the randomly selected student did not meet the inclusion criteria, the next number on the roll was selected. Prior permission had been obtained from the Principal of the institution.

A pretested, predesigned, self-administered questionnaire was used for data collection. Young’s Internet addiction scale was used to assess Internet addiction as this scale was found to be more reliable for college students and probably for Asia,^[12] and Depression Anxiety Stress Scales 21 was used as a reliable scale in assessment in various settings and in different population groups.^[13-16]

The students were briefed before the questionnaire. The questionnaires were distributed to the randomly selected students (lottery method) using the attendance register. Data were entered in MS Excel sheet and analyzed using SPSS 22 (Statistical Package For the social sciences) software developed by IBM, Chicago, Illinois, USA. Chi-square test and Fisher’s exact test were used to test the significance of difference.

Results

The majority (73.1%) of the respondents were

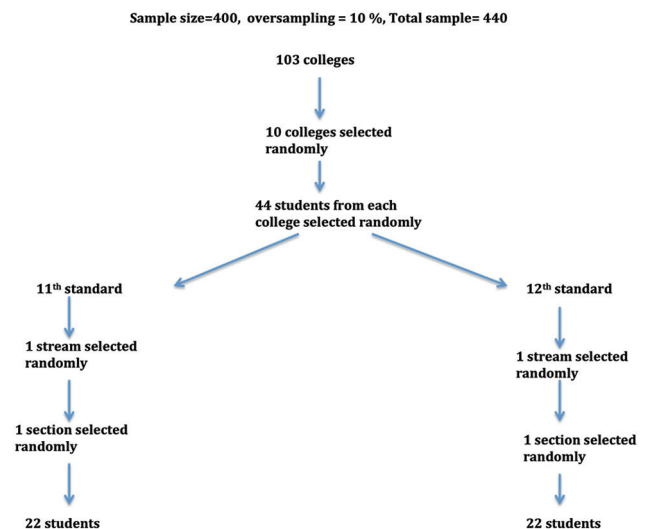


Figure 1: The sampling process followed in the study

Table 1: Characteristics of the study participants, and prevalence of Internet addiction by these characteristics (n=416)

Characteristic	Level of Internet addiction			
	No addiction N (%)	Mild addiction N (%)	Moderate addiction N (%)	Severe addiction N (%)
Gender				
Male	48 (60.0)	198 (72.8)	54 (96.4)	4 (50.0)
Female	32 (40.0)	74 (27.2)	2 (3.57)	4 (50.0)
Living status				
Hostel/PG	40 (50.0)	159 (58.5)	23 (41.1)	2 (25.0)
Parents/family	40 (50.0)	113 (41.5)	33 (58.9)	6 (75.0)
Age (Years)				
16	30 (37.5)	95 (34.9)	35 (62.5)	2 (25.0)
17	10 (12.5)	80 (29.4)	6 (10.7)	3 (37.5)
18	9 (11.3)	39 (14.3)	7 (12.5)	2 (25.0)
19	31 (38.8)	58 (21.4)	8 (14.3)	1 (12.5)

Table 2: Purpose of internet use and time spent on internet by gender

	Males (n=112) (%)	Females (n=304) (%)
Purpose of internet use		
Social networking	57 (19.2)	240 (80.8)
Study	39 (22.3)	136 (77.7)
Chatting	41 (31.8)	88 (68.2)
Online gaming/gambling	33 (29.2)	80 (70.8)
Others	56 (35.0)	104 (65.0)
Hours spent on internet		
<3	57 (50.9)	80 (26.1)
3-6	39 (34.8)	136 (44.7)
7-9	9 (8.0)	40 (13.2)
>9	7 (6.3)	48 (15.8)

female [Table 1]. The mean age of the respondents with Internet addiction was 17.2 years. The overall prevalence of Internet addiction was 80.7%, with 84.2% female and 71.4% male. An analysis of the various grades of mild, moderate, and severe addiction showed that 65.4% of the respondents had mild, 13.46% had moderate, and 1.9% had severe addiction. More than half of the respondents (54%) lived in a hostel or were paying guests in rented accommodation [Table 1].

The main purpose of using the Internet was social networking (71.4%) followed by study (42.1%). The Internet was used for 3–6 h/day by 42.1% of the respondents [Table 2].

Those having internet addiction are found to be more depressed (odds ratio=14, 95% CI=7.9-24.6), stressed (odds ratio=12, 95% CI=5.5-25.7) and anxious (odds ratio=3.3, (95% CI=1.9-5.6), as compared to those who are not having internet addiction. There was a significant association between Internet addiction and depression, anxiety, and stress ($P < 0.0001$). There was a high prevalence of depression (85.7%) and anxiety (83.3%) in the participants addicted to the Internet [Table 3].

Discussion

In this study, we tried to find the prevalence of Internet addiction and its various correlates in adolescents in higher secondary colleges/schools in the urban areas of Kamrup district, Assam, and to find the association between this addiction to the Internet and depression, anxiety, and stress. The high prevalence of Internet addiction (80.7%) in the present study requires an in-depth qualitative research. However, there is no clear-cut definition of Internet addiction. In a study conducted in Lucknow (Piyush Upadhyay *et al.*, 2017), 74.5% were found to be potential addicts.^[17] A result which is in accord with our study findings. However, in another study in North India,^[18] the prevalence of moderate Internet addiction was 24% and 6% severe Internet addiction,^[18] which is comparatively lower than found in our study. This low prevalence of Internet addiction in the study by Manohar Bhatia *et al.*^[18] could be due to the study setting, which was in a professional institute.

The average age of Internet addicts in our study was 17.21 years, which correlates with the average age of addiction revealed in the study conducted by Bernardi and Pallanti at 16.67 ± 1.85 of 16.67 ± 1.85 years.^[19]

Female adolescents had higher levels of Internet addiction (84%) as compared to their male counterparts (71.4%). The finding of higher prevalence of addiction in female respondents was in contrast with other studies conducted by Mazalin and Moore 2004,^[20] Chen and Fu 2009,^[21] and Hasanzadeh *et al.* 2012^[22] on a teenage population on the association between gender and Internet addiction, where male Internet addiction was found to be significantly higher. This could be attributed to the comparatively higher percentage of female respondents and perhaps the relatively higher female attendance at classes (our study was conducted during lecture hours).

Table 3: Association between Internet addiction and depression, stress, and anxiety (n=416)

Internet addiction	Depression				Anxiety				Stress			
	Present n	Absent n	Odds ratio	95% CI OR	Present n	Absent n	Odds ratio	95% CI OR	Present n	Absent n	Odds ratio	95% CI OR
Present	288	48	14	7.9-24.6	280	56	3.33	1.9-5.6	192	144	12	5.5-25.7
Absent	24	56			48	32			8	72		

In our study, most students used the Internet 3–6 h/day (42.1%). A relatively fewer number of students used the Internet for >9 h/day (11.5%). This is in contrast to a study conducted by Mutalik *et al.* 2018^[23] and by Sharma *et al.* 2014^[24] in which the average hours of Internet use per day was found to be less than 3 h. The reason for this difference could be that our study was conducted in a general college on students in the humanities, commerce, and science, whereas the aforementioned study was conducted on students doing professional courses with vast study syllabus that allowed the students relatively little spare time for Internet use.

The predominant use of Internet by both sexes was 71.4% for social networking followed by 42.1% for study. This is similar to the findings reported by Scimeca *et al.*^[25]

Numerous studies have found that there is a significant association between Internet addiction and such psychological morbidities as depression, stress, suicide intention, aggression, and antisocial behaviors.^[26-29] These studies corroborate our findings of significant association between depression, stress, and anxiety and Internet addiction ($P < 0.0001$). The cause and effect relationship between Internet addiction and depression, stress, and anxiety could not be established considering the cross-sectional design of the study.

Chang and Hung (2012)^[30] stated that the Internet is used by addicts as a means of avoiding and dealing with underlying psychological problems. In our study too, it was not possible to establish whether this addiction was the cause or the result of various psychological morbidities. The limitations of the study include smaller sample size not including qualitative research technique owing to research constraints.

Conclusion

With the exponential growth of Internet consumers worldwide, there has arisen a significant increase in Internet addiction particularly in adolescents and young adults. The scene in India in general and Assam, in particular, is no different. With the rapid penetration of the Internet into all corners of the country, the dependence on it for numerous purposes ranging from social media, data collection to news, has increased. People frequently enter the narrow corridors of the virtual world either to escape from depression or to gain

acceptance from friends and peers. Our study has shown a significant association between Internet addiction and depression, anxiety, and stress. Often there is a vicious cycle of depression resulting in Internet addiction which further begets depression. Found in our study as well as most earlier ones is the significant association between Internet addiction and depression, anxiety, stress which supports the idea that Internet addiction should be included in the next iteration of DSM. Many studies with larger sample size are required to explore the gravity of the situation. The need now is to recognize Internet addiction as a genuine problem and address it before it escalates to alarming proportions.

A holistic approach is required to limit the use of the Internet by adolescents by involving and educating parents, teachers, and policymakers about the adverse consequences of Internet addiction.

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Conflicts of interest

There are no conflicts of interest.

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