

Original article**The Prevalence of Internet Addiction and its relationship with Depression, Anxiety and Stress among Higher Secondary School Students: North-East Perspective**

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Abstract

Background: Internet use is associated with social and psychological variables, especially in the adolescent's population. The present study aimed to investigate the extent of internet addiction among higher secondary school going students and to examine the relationships between internet addiction, depression, anxiety, and stress.

Method: The present study was a cross-sectional survey design conducted among higher secondary school students, purposive sampling technique was used to select the Higher Secondary School from Tezpur, Assam. Three hundred higher secondary school going students were randomly selected from Tezpur, Assam, using simple random sampling technique as per inclusion and exclusion criteria. Socio-demographic details were filled and subsequently, The Internet Addiction Test, Online Cognition Scales [OCS] and Depression Anxiety Stress Scale [DASS] were administered.

Results: The prevalence of internet addiction was found to be 34% (severe internet addiction) among higher secondary school students. The study reported the presence of depression (11.3% mild level and 4.6 % moderate level), anxiety (6.5 % mild level and 4.6 % moderate level) and

stress (20% mild level and 6.6% moderate level) among higher secondary school students. Online cognition score had significant positive correlation with depression, anxiety and stress.

Conclusion: This research shows that internet addiction is present in the higher secondary school students and it has significant relationship with depression, anxiety, and stress. There is a need to explore interventions to deal with internet addiction in the school population.

Keywords: Internet Addiction, Depression, Anxiety, Stress.

Introduction

Globally, it is observed that there is a drastic increase in the number of social networking sites [SNSs] users. In India, the most popular social networks are YouTube, Facebook, and WhatsApp. Studies indicate that the risk of internet addiction seems to be rising especially among young people [1-3]. Social networking sites like Facebook, Twitter, online games, online shopping, gambling, etc., lead to increase in the numbers of internet addiction and can create a serious problem in the near future among adolescents [4, 5]. Several studies have been conducted in India on internet addiction (6-11); the prevalence of internet addiction varies from 0.3% to 74.5%. In the northeastern part of India, there is only one study on internet addiction, which reported that nearly half of the medical students (46.8%) were at increased risk of internet addiction [11]. From the research conducted in India, it was found that there is wide variation in the prevalence of internet addiction in India. Internet users can have wide-ranging adverse consequences of an individual's life that can affect interpersonal, social, occupational, psychological, and physical functioning [12-18]. Various studies have reported positive association of internet addiction with depression, anxiety, and stress in adolescents and students [19-23]. In India, use of the internet is high, especially among school and college students.

Hence, it is necessary to study the pattern of internet usage among school students in the Indian setting and its relationship with their mental health. Despite the increasing significance of the internet as well as the rising number of problems resulting from internet usage, there have been limited studies on the nature of internet use and its consequences in north-east India. There is a scarcity of information regarding the prevalence of internet addiction and its relationships with depression, anxiety, and stress among school students. Hence, it is important to study the effect of internet addiction among higher secondary school going students in northeast India as this could provide valuable insights into the nature of internet usage among school going students and its relationship with their mental health. The present study aims to assess the prevalence of internet addiction and its relationship to depression, anxiety and stress among higher secondary school students from north-east India.

Method

The present study was a cross-sectional survey conducted among higher secondary school students; purposive sampling technique was used to select the Higher Secondary School from Tezpur, Assam. Krejcie & Morgan [24] method was used to determine the sample size determination table (Confidence level = 95; Margin Error of 5.0%). The total population of the school among higher secondary school students was around 900 [both first year and second year]. A total of three hundred students [10+2 class] included in the study using simple random sampling technique. List of students both male and female, conforming to internet use for the last 6 months or more, was prepared for the school and they were assigned the sequential number. Confidentiality was assured and informed consent was taken. The study was undertaken with the permission of the scientific and ethical committee of LGBRIMH, Tezpur.

Measures

1. Semi-structured proforma: Semi-structured proforma contained details of socio-demographical information like gender, age, education background, academic performance, weekly internet usage, internet experience, and the type of internet activity frequently engaged.
2. The Online Cognition Scale [25] [OCS]: This scale contains 36 items on a 7-point likert-type scale. It measures problematic internet use and it has four sub-dimensions: loneliness/depression, diminished impulse control, distraction, and social comfort. The OCS have demonstrated high internal consistency [an alpha level of .94] and for each of its subscales [social comfort 0.87, loneliness /depression 0.77, diminished impulse controls 0.84 and distraction, 0.8].
3. The Internet Addiction Test [26] [IAT]: For the present study, The Internet Addiction Test scale was used to assess the internet addiction. It consists of a 20-item 5-point likert scale. It measures the severity of self-reported compulsive use of the internet. The scale has good internal consistency [an alpha coefficient of 0.93]. Higher score indicates greater severity of internet addiction. The total scores obtained on the scale was divided into three categories. Those who scored 20-29 were the online user with complete control [normal]. Those who scored from 40 to 69 were those who experience frequent problems because of excessive Internet use. Those who scored from 70-100 were considered to have significant problems [severe internet addiction].
4. The Depression Anxiety Stress Scale [DASS] [27]: The DASS is a 42-item self-report inventory that provides scores of three subscales: depression [14-items], anxiety [14-items], and stress [14-items]. Each item was rated on a 5-point scale. The internal consistency alpha coefficient was found to be good for depression [0.90], anxiety [0.92], and stress [0.92].

Statistical Analysis

Data were analyzed using SPSS version 20. Descriptive statistics like frequency, the percentage was used to assess the socio-demographic data, internet addiction, depression, anxiety, and stress. Correlation between problematic internet use and depression, anxiety, and stress was described using Pearson correlation by keeping p-value of less than 0.05 as significant.

Results

A total of 300 high school going students was selected for this present study among which the majority [76%] were males. The mean age of the respondents was 17.44 years.

Majority of the respondents said that the main reason for internet use was social networking /making friends [100%], emailing current friends [100%], information surfing for study/school related work [100%], information surfing for personal interests [73%], playing web games [63%], and downloading music/movies from Internet [56%]. About 20% of the respondents were using the internet for watching pornography [Table-1].

Table-1: Reasons for using internet among higher secondary school students

Variables	Frequency (%)
Social networking[face book, hike, twitter etc]	300 (100%)
Emailing friends	300 (100%)
Information Surfing for study/school/college related work	300 (100%)
Information Surfing for personal interests	220 (73.3%)
Playing Web Game	190 (63.3%)
Downloading music/movies from Internet	170 (56.6%)
Pornography	60 (20%)

About 102 [34%] of the respondents were found to have severe internet addiction on internet addiction scale, while 61 [20.33%] were having frequent problems due to internet usage and 137 [45.66%] of the respondents were normal users [table-2].

Table-2: Prevalence of Internet addiction among school students

Variable		Frequency (%)
Internet addiction scale	Online user with complete control [Normal range]	137 (45.66)
	Frequent problems due to internet usage	61 (20.33)
	Internet is causing significant problem [severe addict]	102 (34%)

Nearly 10.66 percent [32] participants spent less than 1 hour on the internet in a day. It was found that 18 percent [54] spent one to two hours, while 40 percent [120] spent two to three hours and 31.33 percent [94] spent more than three hours for internet usage in a day [Table-3].

Table-3: Time spent in the usage of internet by participants

Time (hours)	Frequency (%)
Less Than 1 hour	32 (10.66)
1-2 hours	54 (18)
2-3 hours	120 (40)
More than 3 hours	94 (31.33)

Table-4: Depression, Anxiety and stress among higher secondary school students

Variables		Frequency (%)
Depression	Normal	252 (84%)
	Mild	34 (11.3%)
	Moderate	14 (4.6%)
Anxiety	Normal	266 (88%)
	Mild	20 (6.6%)
	Moderate	14 (4.6%)
Stress	Normal	220 (73.3%)
	Mild	60 (20%)
	Moderate	20 (6.6%)

In the present study, 11.3 % of higher secondary school students were having mild depression and 4.6 % were having moderate depression and 6.6 % were having mild anxiety and 4.6 % were having moderate anxiety. In the domain of stress, 20% were having a mild stress and 6.6% were having moderate stress [table-4].

Online cognition total score was positively correlated with depression [$r=123$, $p\leq 0.01$], anxiety [$r =.179$, $p\leq 0.01$] and stress [$r =.216$, $p\leq 0.01$]. Social comfort domain of online cognition scale was negatively correlated with depression [$r =-.135$], anxiety [$r =-.293$, $P\leq 0.01$] and stress [$r =.244$, $p\leq 0.01$ level]. Loneliness domain of online cognition scale was positively correlated with depression [$r =.121$, $p\leq 0.05$ level], anxiety [$r =.170$] and stress [$r =.192$, $p\leq 0.01$]. In domain of impulsivity significant positive correlation was found with depression [$r =.257$, $p\leq 0.01$], anxiety [$r =.230$, $p\leq 0.01$ level] and stress [$r =.001$, $p\leq 0.01$] and in the domain of distraction significant negative correlation was found with depression [$r =-.216$, $p\leq 0.01$] anxiety [$P=-.079$, $p\leq 0.05$ level] and stress [$r =-.008$, $p\leq 0.050$] [Table-5].

Table-5: Association between online cognition scales [Problematic Internet Use], and depression, anxiety and stress scale (DASS)

Scale	Depression	Anxiety	Stress
On Line Cognition Scale	.123**	.179*	.216**
Social Comfort	-.135	-.293**	-.244**
Lonely/Depressed	.121*	.170	.192**
Diminished Impulsive control	.257**	.230**	.001*
Distraction	-.216**	-.079*	-.008*

**correlation is significant at the $p\leq 0.01$, Pearson Correlation

In social comfort domain of online cognition scale had significant positive correlation with years of internet use [$r =.456$, $p\leq 0.01$]. Loneliness domain of online cognition scale was positively correlated with years of internet use [$r =.285$, $p\leq 0.01$] and hours per day [$r =-1.44$, $p\leq 0.01$].

Domain of impulsivity was also positively correlated with years of internet use [$r = .059$] and hours per day [$r = .134$], and domain of distraction was also positively correlated with years of internet use [$r = .028$] and hours per day [$r = .094$] [Table-6].

Table-6: Correlation between online cognition scales [Problematic Internet Use], duration of internet use in years and hours per day

Scale	Duration	
	Years of Internet use	Hours per day
Social Comfort	.456**	.035
Lonely/Depressed	.285**	.144**
Impulsive	.059	.134
Distraction	.028	.094

**correlation is significant at the $p \leq 0.01$

Discussion

Three hundred higher secondary school going students were selected for this present study from Tezpur, Assam from which majority were male students. The mean age of the respondents was 17.44 years in the present study. Chak [28] reported individuals with internet addiction inclined to be students and younger in age compared to non-addiction. In the present study, the majority of the respondents said that the main reason for internet use was social networking /making friend, emailing current friends, information surfing for study/school related work, information surfing for personal interests, playing web-games, downloading music/movies from the internet. An Indian study by Chathoth et al. [1] reported the most common purpose of internet use as social networking [97.8%] and emailing [87.8%].

In index study, 45% of the respondents had complete control on internet use, 20% of the respondents were having frequent problems due to internet usage and 34% of the respondents were having significant problems [severe addiction] as per internet addiction scale. Other studies

among child and adolescents have reported 1.6% to 17% prevalence of internet addiction [29, 30-34]. Wide variation has been reported in the prevalence of internet addiction among high school students in India, as D'Souza et al. [6] found that 30.8% of the student had high levels of internet addiction, while Yadav et al. [35] found that 11.8 percent of students had an internet addiction. Prabhakaran et al. [36] reported the prevalence of internet addiction among school-going adolescents to be 8.7% which is lower when compared to other Indian studies. Similarly worldwide research on internet addiction also report wide variation in the prevalence of internet addiction in students' population. In Taiwan 13.8% has been reported as internet addicts [37] and in China, 2.4% of the adolescents were Internet addicts [38]. In Korea, it was shown that 30% of the adolescents were 'possible' Internet addicts, and 4.3% were Internet addicts [39]. In Iran 22.2% [40] and in Japan 0.03% students were having internet addiction [41].

In the present study, 4.6 % were having a moderate level of depression, 4.6 % were having moderate level of anxiety and n 6.6% were having moderate level of stress. Many studies have shown that internet addiction leads to depression, anxiety, and stress [12, 42-46]. Online cognition total score has correlation with depression, anxiety and stress. Internet addiction has a positive relationship with depression, loneliness, and self-esteem Ko et al. [43] & Kraut et al. [47].

Social comfort, lonely, impulsivity and distraction domain of online cognition scale had a correlation with years of internet use and hours per day. Yadav et al. [35] found that internet addiction has the relationship with the time spent online and the usages of social networking sites. Studies have shown the growing dependence among young people on social media and spending an excessive amount of time on Facebook might lead to a severe negative effect on one's activities in life like work, school and face-to-face interactions [48, 49]. Social networking

sites can lead to various negative impacts on the adolescent such as low self-esteem, poor academic performance, mental health issues [especially depression and anxiety] and relationship problems [44, 50, 51]. The present work has certain limitations such as instead of assessing all type of psychological morbidity only depression, anxiety and stress were included in the present study. Detailed mental health assessment was not done. The samples [respondents] were taken only from one school using purposive sampling technique and so the study cannot be generalized. The study design was cross-sectional the causal association cannot be established. Similar studies need to be replicated in different areas with a large sample for better generalization of results. To conclude, internet use is now considered to form part and parcel of every higher secondary school going student's life and hence studying internet use and its relationship with depression, anxiety and stress are important for preventing mental health issues and promoting the well-being of these individuals. This research shows that internet addiction is present in the school going children and it has a direct impact on their mental health [depression, anxiety, and stress]. Educational initiation and parental involvement are required to prevent overuse of internet. There is a need to explore the intervention model to help individuals with internet addiction, especially for these young populations.

Conflict of interest: None declared.

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