

RELATIONSHIP BETWEEN INTERNET ADDICTION AND DEPRESSION AMONG YOUNG ADULTS IN DHAKA, BANGLADESH

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Abstract

This study explored the relationship between internet addiction and depression among young adults in Dhaka. A conveniently selected sample of 200 participants aged 18-35 completed the Internet Addiction Test (IAT) and Patient Health Questionnaire-9 (PHQ-9), along with several demographic questions. Descriptive statistics were used to summarise participant demographics, while a series of logistic regressions examined the association between internet addiction and depression. Results indicated a high prevalence of both internet addiction (minimal user: 20.0%; moderate to excessive user: 80.0%) and depression (minimal or no depression: 16.0%; mild to severe depression: 84.0%) among the study sample. The study found a significant association between internet addiction and depression, with moderate to excessive internet users being 3.7 times more likely to experience depression compared to minimal users. These findings emphasise the need for increased awareness about internet use among young adults to mitigate the risk of associated depression.

Introduction

The internet has become integral to contemporary living, offering numerous advantages in daily activities and work. Consequently, there has been a remarkable increase in global internet usage. Despite the positive outcomes it brings to our lives, issues related to excessive or inappropriate internet usage are emerging. In 1996, Kimberly Young first introduced the concept of 'internet addiction'⁽¹⁾. Given the numerous health risks associated with addictive internet use, it has emerged as a modern syndrome⁽²⁾. Internet addiction is characterised by an obsessive or excessive behavioural pattern of online internet use, leading to loss of control, withdrawal, and a tendency to escape⁽³⁾. Globally, the substantial increase in internet usage has been significantly amplified after the COVID-19 pandemic^(4,5), further aggravating the urgency of issues related to 'internet addiction.' Besides, a recent systematic review found that young adults are experiencing a significant rise in internet addiction due to cultural influences, decreased social interaction, and a growing focus on individualism⁽⁶⁾.

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Internet use in Bangladesh has increased substantially, and internet use growth is sometimes considered 'faster than socioeconomic development'⁽⁷⁾. This has brought about a great deal of internet addiction in recent years. For example, one study among graduate students of Dhaka University found that nearly 24% of the participants displayed problematic internet use⁽⁷⁾. Another study among young adults in Bangladesh reported that the overall prevalence of internet addiction was 27.1%⁽⁸⁾. Other studies among students at tertiary-level education institutes⁽⁹⁾ and among adults⁽¹⁰⁾ reported that the prevalence of problematic or addictive internet use was 26% and 29.4%, respectively in Bangladesh.

Significantly, an increasing number of recent studies have established a connection between internet addiction and depression⁽¹¹⁾, anxiety⁽¹²⁾ and the quality of sleep⁽¹³⁾. Multiple studies indicated that among individuals addicted to the internet, depression is more prevalent than among normal users^(3,14). Akini and Iskender⁽¹⁵⁾ reported that among Turkish students, depression and anxiety emerged as significant predictors of internet addiction. A systematic review on mental health issues in excessive internet use found that 75% of studies noted a significant relation between pathological internet use and depression. Among various psychiatric conditions, depression exhibited the highest correlation with excessive internet use⁽¹⁶⁾.

Existing literature shows that internet addiction has a negative impact on individuals' study, work, and daily life, especially among adolescents and young adults, such as more likely to feel lonely, low self-esteem, poorer academic performance, and associated mental health problems such as insomnia, anxiety, depression, self-harm, and suicidal behaviour^(15,17). Nevertheless, the latest edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM-V) did not officially classify internet addiction as a clinical disorder⁽¹⁸⁾. This highlights the necessity for more research evidence regarding this emerging mental health epidemic. Depression is a frequently reported mental illness that exhibits a correlation with excessive internet use⁽¹⁶⁾. Despite internet addictions showing association with depression and high risk among young adults, these areas are still under-researched. The COVID-19 pandemic has reinforced the existing situation^(4,5). To date, most of the studies conducted on internet addiction in Bangladesh focused only on the prevalence of internet addiction and its determinants^(8,10,19) except few studies explored the association between problematic or addictive internet use and psychological distress⁽⁷⁾ and sleep quality and self-rated health⁽⁹⁾. To our knowledge, a few studies in Bangladesh explored the relationship between internet addiction and depression among different age groups, such as private medical college students⁽²⁰⁾ and school-going adolescents⁽²¹⁾. To enrich the existing literature in this domain, the present study aimed to see the prevalence of depression and internet addiction among the young adults of Dhaka City and to explore the association between depression and internet addiction after adjusting the sociodemographic variables susceptible to modifying the association of interest.

Materials and Methods

Using a quantitative approach, this cross-sectional study was conducted in Dhaka-the capital city of Bangladesh during August 2023. The participants were young adults aged between 18 and 35 years. A convenience sampling technique was employed, with efforts made to capture maximum variation in demographic variables. The sample size was 200. Data were collected using a structured questionnaire that gathered sociodemographic information, including age, sex, educational level, occupation, marital status, and socioeconomic status. Two scales were used to measure internet addiction and depression.

Internet Addiction Test (IAT): We used the Bangla-validated IAT to assess internet addiction among study participants⁽²²⁾. The original IAT is a 20-item tool designed by Young in 1996 to assess internet addiction^(1,3). The Bangla version, comprising 18 items with four dimensions, utilises a 5-point Likert scale (example item: Neglects household chores to spend more time online, 1=Not at all to 5=Always). Scores range from 18 to 90, with higher scores indicating greater addiction. Based on the total scores, the users can be classified as minimal users (IAT scores 18-35), moderate users (IAT scores 36-62), and excessive users (IAT scores 63-90). The Bangla version exhibits high internal consistency (Cronbach's alpha 0.92) and satisfactory test-retest reliability ($r = 0.89$). In this study, we further grouped the IAT score into two categories without interrupting the original cut-off points for three categories: minimal users (18-35) and moderate to excessive users (36-90). The latter category was considered as 'internet-addicted' for this study.

Patient Health Questionnaire (PHQ-9): We used Bangla-validated PHQ-9^(23,24) to assess levels of depression among study participants⁽²⁵⁾. The nine items of the PHQ-9 are based directly on the nine diagnostic criteria for major depressive disorder in the DSM-IV⁽²⁶⁾. Its nine items use a 4-point Likert scale (Example item: Feeling down, depressed, or hopeless, 0 = Not at all to 3 = Almost every day). The Bangla version displays high reliability (Cronbach's alpha 0.84, Spearman-Brown Coefficient 0.86, Guttman Split-half Coefficient 0.85) and is considered a valid tool for assessing depression in Bangladeshi adults. In this study, we used two categories of depression (minimal or no depression: PHQ-9 score <5; and any (mild to severe) depression: PHQ-9 score ≥ 5). This transformation was considered due to the small sample size, as retaining all categories may pose challenges for regression analysis, potentially resulting in some categories lacking the minimum number of observations required for analysis. This categorization is also used elsewhere⁽²⁷⁾.

Sociodemographic measures: We collected sociodemographic information including age (18-25 years, 26-35 years), sex (male, female), highest educational attainment (Higher Secondary Certificate-HSC, graduate, postgraduate), occupation (student, employed), marital status (married, unmarried), and perceived socioeconomic status (higher class, middle class, lower class).

Procedure

Data were collected using a self-administered questionnaire during a face-to-face interview. Ethical clearance was obtained from the Research Ethics Committee of the

Department of Educational and Counselling Psychology (reference number: DECP/10/08). Each participant was briefed about the study's purpose and asked for their willingness to participate. Written informed consent was obtained from all participants. They were assured that their responses would be used solely for research purposes and that confidentiality and anonymity would be maintained throughout the research process. Participants received verbal instructions on how to complete the questionnaire. Participants were asked to read the standard instructions carefully before responding to the questionnaire. There were no time limits for completing the questionnaire and participation was voluntary.

Data Analysis

We used the Statistical Package for the Social Sciences (SPSS) software, version 20, for data entry, cleaning, and coding. Descriptive statistics, including frequency distribution and percentages, were used to describe participants' sociodemographic information. We used the Chi-square test for independence to assess the differences in the prevalence of internet addiction and depression by sociodemographic characteristics. Given that most of our variables were categorical, with the remaining ones transformed to categorical (such as age), this statistical approach was deemed appropriate. To examine the association between internet addiction and depression, a logistic regression analysis was performed. Bivariate logistic regression was initially conducted to investigate the relationship between depression (outcome variable) and each explanatory variable (internet addiction and sociodemographic characteristics of the study participants) separately. Subsequently, multivariable logistic regression was performed to assess the association between depression and internet addiction, adjusting for other explanatory variables. Crude odds ratios (cOR), adjusted odds ratios (aOR), and 95% confidence intervals (CI) were estimated, with a p-value <.05 considered statistically significant.

Results and Discussion

(a) Participant characteristics

Table 1 presents the background information of the study participants. The participants were 19 to 32 years old. Most respondents (72.0%) fall within the age category of 18 to 25 years, while the remaining 28.0% are aged between 26 to 35 years. More than half (57%) of the respondents were female. The highest educational qualification of the participants ranged from HSC to a master's degree. Of the participants, 72% were students, and 28% were employed. Regarding marital status, 24.5% of the participants were married, while 75.5% were unmarried. According to self-reported data, most respondents belong to the middle socioeconomic class (61.5%).

Table 1. Sociodemographic characteristics of the study participants (n = 200)

Variable categories	Frequency (n)	Percent (%)
Age (in years)		
18-25	144	72.0
26-35	56	28.0
Sex		
Male	86	43.0
Female	114	57.0
Highest educational attainment		
Higher Secondary Certificate (HSC)	100	50.0
Graduate	55	27.5
Postgraduate	45	22.5
Occupation		
Student	144	72.0
Employed	56	28.0
Marital status		
Married	49	24.5
Unmarried	151	75.5
Socioeconomic status (perceived)		
Higher class	33	16.5
Middle class	123	61.5
Lower class	44	22.0

(b) Prevalence of internet addiction and depression

Overall, 80.0% of participants were classified as moderate to excessive users, while only 20.0% were minimal users (Table 2). In terms of age, 77.1% of participants aged 18-25 years were moderate to excessive users, compared to 87.5% of participants aged 26-35 years, though the difference was not statistically significant ($\chi^2 = 2.74, p = .098$). Sex differences were also insignificant, with 80.2% of males and 79.8% of females being moderate to excessive users ($\chi^2 = .01, p = .943$). However, significant differences were observed in relation to highest educational attainment ($\chi^2 = 6.56, p = .038$), occupation ($\chi^2 = 10.42, p = .001$), and marital status ($\chi^2 = 3.89, p = .049$) significantly associated with internet addiction. Regarding perceived socioeconomic status, 90.9% of higher-class participants were moderate to excessive users, 74.8% of middle-class participants were moderate to excessive users, and 86.4% of lower-class participants were moderate to excessive users, though these differences were not statistically significant ($\chi^2 = 5.65, p = .059$).

Table 2. The prevalence of internet addiction by sociodemographic variables among the study participants (n = 200)

Variable categories	Internet user category		p-value*
	Minimal user (IAT score: 18-35) % (n)	Moderate to excessive user (IAT score: 36-90) % (n)	
Overall	20.0 (40)	80.0 (160)	
Age (in years)			.098
18-25	22.9 (33)	77.1 (111)	
26-35	12.5 (7)	87.5 (49)	
Sex			.943
Male	19.8 (17)	80.2 (69)	
Female	20.2 (23)	79.8 (91)	
Highest educational attainment			.038
Higher Secondary Certificate (HSC)	18.0 (18)	82.0 (82)	
Graduate	30.9 (17)	69.1 (38)	
Postgraduate	11.1 (5)	88.9 (40)	
Occupation			.001
Student	25.7 (37)	74.3 (107)	
Employed	5.4 (3)	94.6 (53)	
Marital status			.049
Married	10.2 (5)	89.8 (44)	
Unmarried	23.2 (35)	76.8 (116)	
Socioeconomic status (perceived)			.059
Higher class	9.1 (3)	90.9 (30)	
Middle class	25.2 (31)	74.8 (92)	
Lower class	13.6 (6)	86.4 (38)	

*p-value was generated through the Chi-square test

Overall, 84.0% of participants were classified as having mild to severe depression, while only 16.0% had minimal or no depression (Table 3). The χ^2 test indicated that participants' age, sex, highest educational attainment, occupation, and marital status were not significantly associated with depression. However, there were significant differences in depression prevalence related to perceived socioeconomic status ($\chi^2 = 14.30$, $p = .001$). Specifically, 100.0% of higher-class participants had mild to severe depression compared to 76.4% of middle-class participants and 93.2% of lower-class participants.

Table 3. The prevalence of depression by sociodemographic variables among the study participants (n = 200)

Variable categories	Depression Category		p-value*
	Minimal or no (PHQ-9 score <5) % (n)	Mild to severe (PHQ-9 score ≥5) % (n)	
Overall	16.0 (32)	84.0 (168)	
Age (in years)			.680
18-25	16.7 (24)	83.3 (120)	
26-35	14.3 (8)	85.7 (48)	
Sex			.099
Male	20.9 (18)	79.1 (68)	
Female	12.3 (14)	87.7 (100)	
Highest educational attainment			.805
Higher Secondary Certificate (HSC)	16.0 (16)	84.0 (84)	
Graduate	18.2 (10)	81.8 (45)	
Postgraduate	13.3 (6)	86.7 (39)	
Occupation			.089
Student	18.8 (27)	81.3 (117)	
Employed	8.9 (5)	91.1 (51)	
Marital status			.203
Married	10.2 (5)	89.8 (44)	
Unmarried	17.9 (27)	82.1 (124)	
Socioeconomic status (perceived)			.001
Higher class	0.0 (0)	100.0 (33)	
Middle class	23.6 (29)	76.4 (94)	
Lower class	6.8 (3)	93.2 (41)	

*p-value was generated through the Chi-square test

(c) Association between internet addiction and depression

The unadjusted model showed that internet addiction was significantly associated with depression (cOR: 4.2; 95% CI: 1.9-9.6; $p < .001$), which indicates a 4.2 times higher likelihood of having any depression among moderate to excessive internet users compared to minimal internet users (Table 4). In the fully adjusted model, the strength of the association attenuated yet remained a strong and significant association between moderate to excessive internet addiction and depression, with an adjusted odds ratio (aOR) of 3.5 (95% CI: 1.4-8.3, $p = .005$), indicating that individuals with higher levels of internet addiction were significantly more

likely to experience depression. In contrast, other sociodemographic variables, including age, sex, educational attainment, occupation, and marital status, did not show statistically significant associations with depression. Specifically, educational attainment (graduates: aOR = 0.8, 95% CI: 0.3-2.2, $p = .713$; postgraduates: aOR = 0.4, 95% CI: 0.1-2.2, $p = .305$), occupation (aOR = 2.6, 95% CI: 0.5-13.2, $p = .243$), and marital status (aOR = 0.7, 95% CI: 0.2-2.2, $p = .511$) were not significantly associated with depression. This highlights the critical impact of internet addiction on mental health, independent of these sociodemographic factors.

Table 4. Association between internet addiction and depression, controlling for sociodemographic correlates ($n = 200$)

Variable categories	Unadjusted/Crude			Adjusted*		
	cOR	[95% CI]	p -value	aOR	[95% CI]	p -value
Internet addiction						
<i>Minimal</i>	Ref			Ref		
<i>Moderate to excessive</i>	4.2	[1.9,9.6]	<.000	3.5	[1.4,8.3]	.005
Highest educational attainment						
<i>Higher Secondary Certificate (HSC)</i>	Ref			Ref		
<i>Graduate</i>	0.9	[0.4,2.0]	.728	0.8	[0.3,2.2]	.713
<i>Postgraduate</i>	1.2	[0.4,3.4]	.679	0.4	[0.1,2.2]	.305
Occupation						
<i>Student</i>	Ref			Ref		
<i>Employed</i>	2.4	[0.9,6.5]	.096	2.6	[0.5,13.2]	.243
Marital status						
<i>Married</i>	Ref			Ref		
<i>Unmarried</i>	0.5	[0.2,1.4]	.209	0.7	[0.2,2.2]	.511

Note. cOR=Crude odds ratio, aOR=Adjusted odds ratio, and CI=Confidence Interval, *Adjusting for (age, sex, educational attainment, occupation, and marital status)

This cross-sectional study estimated the prevalence of internet addiction and depression among young adults in Dhaka city. This study also explored the association between internet addiction and depression among the study sample. Findings show that overall, internet addiction was high among young adults in Dhaka city, and this prevalence was higher compared to other studies among young adults in Bangladesh^(7,8). This could be due to the differences in the cut-off of IAT score to define internet addiction. We found that both young males and females had a high level of internet addiction. On the contrary, existing literature indicates a higher prevalence of internet addiction among young male participants compared to females in Bangladesh^(9,19). This finding underscores the need for equal attention to be paid to both males and females to curb addictive internet use among Bangladeshi young adults.

The study revealed a high prevalence of depression among study participants. Our classification of depression, which includes mild to severe, might be one of the key reasons for this high prevalence. Consistent with existing literature^(7,28), our analysis showed that internet addiction was significantly associated with depression after adjusting all the sociodemographic variables. People with addictive internet use suffer from real-life social interactions, leading to social isolation⁽²⁹⁾. Living in isolation most of the time is not helpful when the person faces life challenges and thus could suffer from depression. Also, spending excessive time online has been linked to poor academic performance and a fragile relationship^(15,17)—all these factors precipitating depression.

However, due to the cross-sectional nature of our study, we are unable to infer that internet addiction leads to depression. A prospective design will be helpful to unpack the direction of this association. The study relied on self-reported behaviour, further limiting the results. The self-report method reflects the respondent's perspective, which may be more suitable for reporting subjective disorders⁽³⁰⁾. Another limitation was the small sample size due to time and resource constraints. Future research should consider the inclusion of large sample sizes to facilitate a more comprehensive examination of the association between internet addiction and depression across all levels. In conclusion, the study findings underscore the importance of fostering awareness among young adults regarding internet usage to mitigate the risk of associated depression.

Conflict of interest: None

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