Original Research Article

Depression, Anxiety and Stress with Problematic Internet use Among Youth Attending; A Tertiary Care Hospital in Bangladesh

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Abstract

Background: Excessive and uncontrolled internet use can significantly impair daily functioning in various life domains. Despite the numerous benefits of the internet, its addictive use is a growing concern, particularly among youth, who are prone to anxiety, depression, and stress-related disorders. Understanding the current scenario is essential for devising effective interventions, yet no scientific data is available in Bangladesh. *Objective:* To assess between depression, anxiety, and stress among youth with problematic internet use (PIU) attending a tertiary care hospital. *Methods:* This cross-sectional and descriptive study was conducted at the Department of Psychiatry, Department of Bangabandhu Sheikh Mujib Medical University, from October 2020 to September 2022. Participants were interviewed using a structured socio-demographic questionnaire, the Bangla versions of the Internet Addiction Test (IAT), and the Depression Anxiety and Stress Scale-21 (DASS-21-BV). Data were analyzed using SPSS 26.0, with significance set at p<0.05. *Results:* Among the 90 participants (mean age: 21.33 years; 68% male, 32% female), 95% were students, and 87% were from nuclear families. Internet use exceeded one year for 83% of participants. PIU levels were minimal in 15%, moderate in 62%, and excessive in 22%. Severe depression was observed in 15% of participants, severe anxiety in 25%, and severe stress in 25%. Extremely severe levels of depression, anxiety, and stress were found in 14%, 5%, and 14% of participants, respectively. Significant risk factors for PIU included male gender (χ^2=8.217; p=0.02) and over three hours of daily internet use (χ^2=35.289; p=0.001). PIU was significantly associated with depression (χ^2=20.380; p=0.001), anxiety (χ^2=16.159; p=0.019), and stress (χ^2=14.734; p=0.019). *Conclusion:* Depression, anxiety, and stress are significantly associated with PIU. Early risk assessment, proper internet use, and initial screening are essential for managing potential mental disorders linked to PIU.
Keywords: Problematic internet use, Youth, Depression, Anxiety, Stress.

INTRODUCTION

Excessive use of the internet has introduced a new array of problems and challenges, prompting global concern about the influence of social media, manipulation of information, and addictive internet behaviors [1]. The youth demographic, specifically those aged 15 to 24 years, is recognized as one of the most vulnerable groups affected by these issues. Internet addiction is characterized by excessive internet use often associated with a loss of sense of time or neglect of basic needs. Youth are particularly susceptible due to the positive reinforcing effects of internet use, which can induce feelings of well-being and euphoria [2].

Over the past years, access to and usage of the internet have increased exponentially. According to the International Telecommunication Union (ITU), 51% of the world's population was online in 2020 (ITU, 2020). Young people, as enthusiastic adopters of technology, exhibit relatively high levels of internet use, with nearly 70% of those aged 15 to 24 years using the internet globally. In developed countries, this figure approaches near-universal usage among young people. Additionally, the number of active mobile-broadband subscriptions worldwide stood at 75 per 100 inhabitants in 2020 [3].

Social media is among the most popular activities for youth. Using the Bergen Social Media Addiction Scale (BSMAS) and latent profile analysis, studies indicate that 4.5% of adolescents fall into the at-

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risk group, reporting low self-esteem and high levels of depression symptoms [4]. The increasing prevalence and frequency of internet use have given rise to clinical cases exhibiting abuse symptoms. The concept of 'Internet Addiction Disorder' first appeared in 1996, introduced by Dr. Ivan Goldberg, who likened the condition to substance dependence based on the criteria in the Diagnostic and Statistical Manual for Mental Disorders (DSM-IV) [5].

Kimberly Young significantly advanced the understanding of this condition by establishing the term 'Internet Addiction' through an extensive case report and a seminal research article titled "Internet Addiction: Emergence of a New Clinical Disorder" in 1998. Various terms have been used to describe the condition, including Compulsive Computer Use, Virtual Addiction, Pathological Internet Use, Problematic Internet Use (PIU), Internet Addiction Disorder (IAD), and Internet Dependency [6,7].

The prevalence of internet addiction shows considerable variation worldwide. Studies indicate rates ranging from 7.9% to 25.2% among adolescents in Europe and the USA, and from 17.3% to 23.6% in the Middle East and Africa. In Asia, the prevalence among young people and adolescents varies even more significantly, ranging from 8.1% to 50.9% [8]. An epidemiological study in six Asian countries reported PIU prevalence as follows: Philippines (51%), Japan (48%), China (19%), Hong Kong (35%), South Korea (14%), and Malaysia (37.5%) [9]. Internet addiction, especially among the youth, has been linked with numerous psychological issues, including anxiety, depression, and stress-related disorders. This demographic's vulnerability is compounded by the significant amount of time spent online, often leading to neglect of academic responsibilities, social interactions, and physical health. The pervasive nature of internet use, driven by its integration into daily life through mobile devices and social media platforms, exacerbates these risks.

The current study aims to assess between depression, anxiety, and stress among youth with problematic internet use (PIU) attending a tertiary care hospital in Bangladesh. Given the lack of scientific data on this issue in Bangladesh, this research seeks to provide a foundational understanding that can inform the development of effective intervention programs [10]. By identifying the prevalence and impact of PIU on mental health among Bangladeshi youth, this study endeavors to highlight the need for early risk assessment, proper internet use guidelines, and initial screening processes to manage and mitigate potential mental health disorders associated with excessive internet use.

OBJECTIVES
General objective:
- To explore the depression, anxiety, and stress with problematic Internet use among youth attending a tertiary care hospital.

Specific objectives:
- To examine the depression, anxiety, and stress with problematic Internet use.
- To examine the frequency and severity of problematic Internet use among youth attending the defined area.
- To explore the frequency and severity of depression, anxiety, and stress among youth with problematic Internet use.
- To identify the socio-demographic and other variables with problematic Internet use.

MATERIAL AND METHODS
Study Design
This study employed a cross-sectional and descriptive design to investigate problematic internet use (PIU) and psychological distress among youth. Conducted from October 2020 to September 2022 at the Psychiatric Outpatient Department, Child and Adolescent Mental Health Clinic, and De-Addiction Clinic of BSMMU, Dhaka, it included participants aged 15 to 24 years presenting with excessive internet use. Data were collected through face-to-face interviews using structured questionnaires, and statistical analysis was performed to identify significant correlations between PIU and depression, anxiety, and stress.

Inclusion Criteria
The study includes youth aged 15 to 24 years, both male and female, who demonstrate problematic internet use, indicated by an Internet Addiction Test (IAT) score above 18. Participants must also possess the ability to communicate effectively during the interview process.

Exclusion Criteria
The study excludes individuals with severe organic or psychotic disorders that impair communication, youth with intellectual disabilities affecting participation, those with addictions other than internet addiction, and anyone unable to provide informed consent or comprehend the study's procedures.

Data Collection
Data were collected through face-to-face interviews conducted by the researcher with youth aged 15 to 24 years at the Psychiatric Outpatient Department, Child and Adolescent Mental Health Clinic, and De-Addiction Clinic of BSMMU, Dhaka. Each interview, lasting 40-50 minutes, utilized structured socio-demographic questionnaires along with the Bangla versions of the Internet Addiction Test (IAT) and the Depression Anxiety and Stress Scale-21 (DASS-21-BV).

Participants were selected based on inclusion and exclusion criteria, ensuring that only those with problematic internet use and no severe organic or psychotic disorders were included.

Data Analysis

After data collection, the data were thoroughly checked for inconsistencies and cleaned through editing and coding. Statistical analysis was performed using SPSS version 26.0. Categorical variables were described using absolute and relative frequencies, while continuous variables were presented as means with ranges and standard deviations. Group comparisons were conducted using the chi-square test for categorical data. The Pearson product-moment correlation test was employed to examine relationships between variables. All statistical comparisons were considered significant if $p < 0.05$, ensuring robust analysis of problematic internet use and psychological distress among the youth.

Ethical Considerations

The study adhered to ethical guidelines by obtaining informed consent from all participants, ensuring voluntary participation, and maintaining confidentiality. Participants were informed of the study's purpose, procedures, and any potential risks. They were assured of their right to withdraw at any time without repercussions. Ethical approval was secured from the Institutional Review Board (IRB) of BSMMU, and measures were in place to minimize psychological distress and safeguard participants' well-being.

RESULTS

The findings from data analysis where data were collected from patients with PIU. A brief commentary is provided to highlight key research findings and present initial thoughts on clinical practice implications. The part summarizes results according to the objectives of the study and has been divided into sections that describe socio-demographic characteristics, frequency and severity of PIU, prevalence, and severity of depression, anxiety, and stress state in a patient with PIU, the relationship between socio-demographic variables with PIU. A more complete discussion of the main findings concerning previous research and current thinking follows in the next chapter.

Table 1: Socio-demographic characteristics of the participants

Characteristics	Frequency (n)	Percentage (%)
Age	Mean ± SD (21.33±2.505)	
15-19	26	28.8
20-24	64	71.2
Sex		
Male	61	67.7
Female	29	32.2
Profession		
Student	86	95.5
Job Holder	3	3.3
Unemployed	1	1.1
Family Type		
Nuclear	79	87.8
Joint	11	12.2
Family Income		
Less than 10k	22	24.4
10-30k	20	22.2
30-50k	26	28.8
More than 50k	22	24.4

The study population had a mean age of 21.33 years, with a majority (71.2%) aged 20-24 years. The study sample comprised 67.7% males and 32.2% females. Most participants were male (67.7%) and students (95.5%). The high percentage of nuclear family members (87.8%). Income distribution was even, indicating it may not significantly influence PIU. A majority (57.7%) rarely engaged in physical activity, and 64.4% had low social activity. Most participants (83.3%) had used the Internet for over a year, possibly exacerbating PIU.
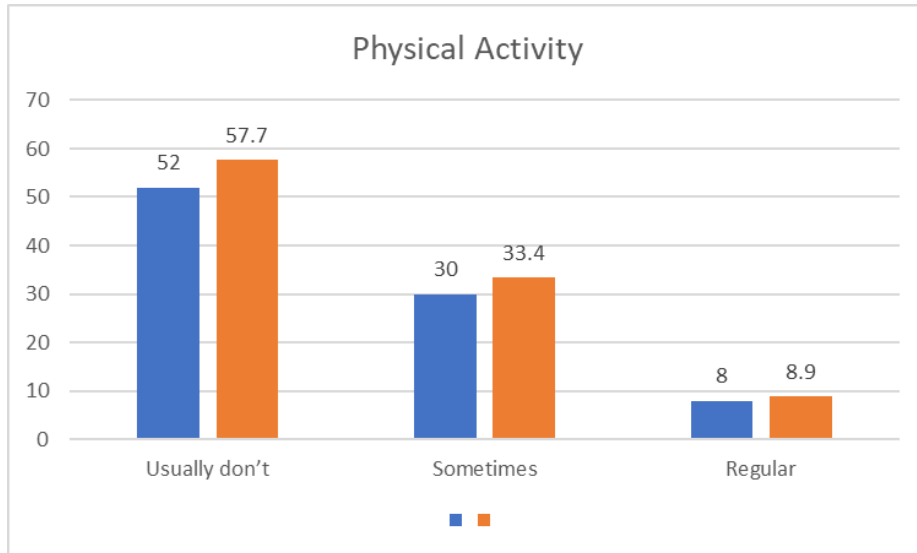
Figure 1: Distribution of Physical Activity Levels

Shows Physical Activity levels: 57.7% "Usually don't", 33.4% "Sometimes", and 8.9% "Regular". Most individuals infrequently engage in physical activity, with few being regular participants.
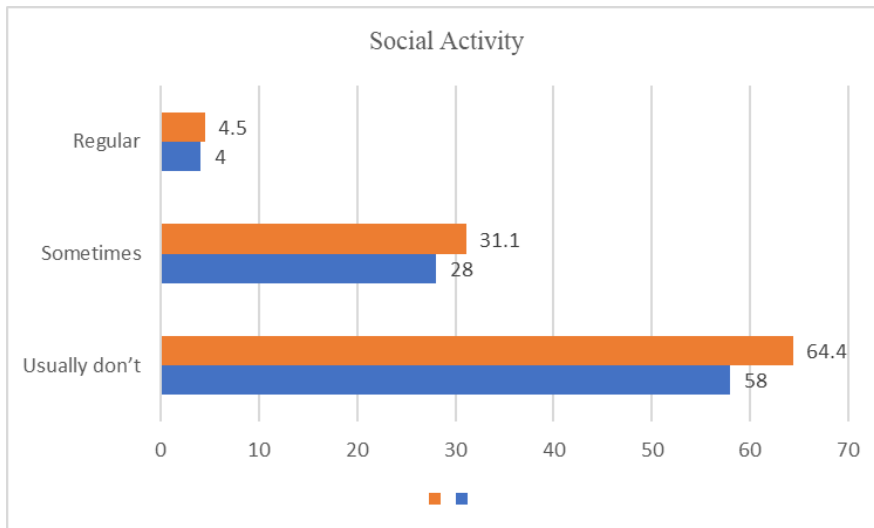

Figure 2: Social Activity Engagement

Highlights Social Activity levels: 64.4% "Usually don't", 31.1% "Sometimes", and 4.5% "Regular". Most people rarely engage socially, with a small percentage participating regularly, reflecting a trend towards limited social interaction.
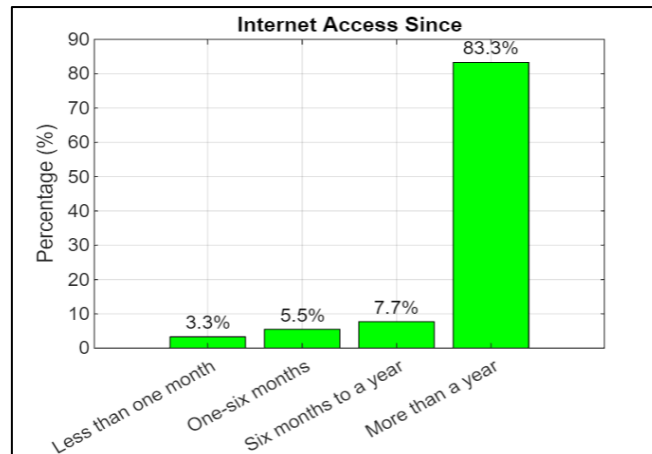
Figure 3: Internet Access Duration

Internet access duration: 83.3% have had access for over a year, while 7.7% have had it for 6 months to a year, and only 8.8% for less than six months, showing long-term usage dominance.
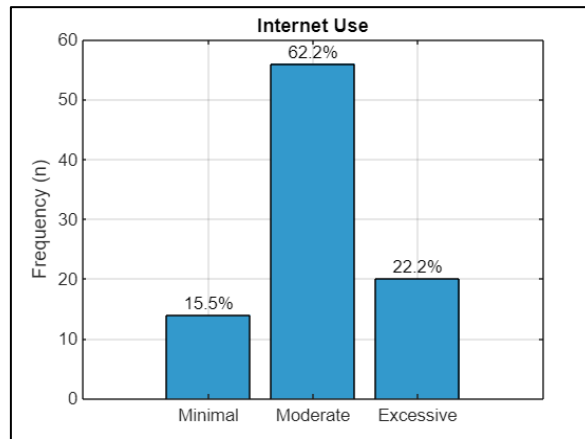

Figure 4: Problematic Internet Use (N = 90)

Mean±SD score of the respondents on problematic Internet use was 50.56±14.01. The minimum score in IAT was 21 and maximum score in IAT was 84. Using the proposed cut-off score we found majority of the respondents (n = 56) were moderate users, 14 of them were minimal users and 20 of them were excessive users. In our study, there were significantly more moderate Internet users than minimal or extreme users.

Table 2: Severity of Depression, Anxiety and Stress measured by DASS21

Variable	Depression	Anxiety	Stress
Normal	10(11.1%)	13(14.4%)	4(4.4%)
Mild	23(25.5%)	25 (27.7%)	20(22.2%)
Moderate	30 (33.3%)	24 (26.6%)	30 (33.3%)
Severe	14(15.5%)	23(25.5%)	23(25.5%)
Extremely severe	13(14.4%)	5(5.5%)	13(14.4%)

Table 2 is showing the DASS-21-BV was used to measure state and severity of depression, anxiety and stress symptoms of the respondents. On DASS-21-BV scale, respondents had the Mean±SD scores of 20.02±9.89 on depression domain, 20.50±9.34 on anxiety domain and 24.58±9.38 on stress domain. Scores on depression domain ranged between 2-40, on anxiety domain 0-40 and on stress domain 4-42. Highest possible score on each domain is 42.
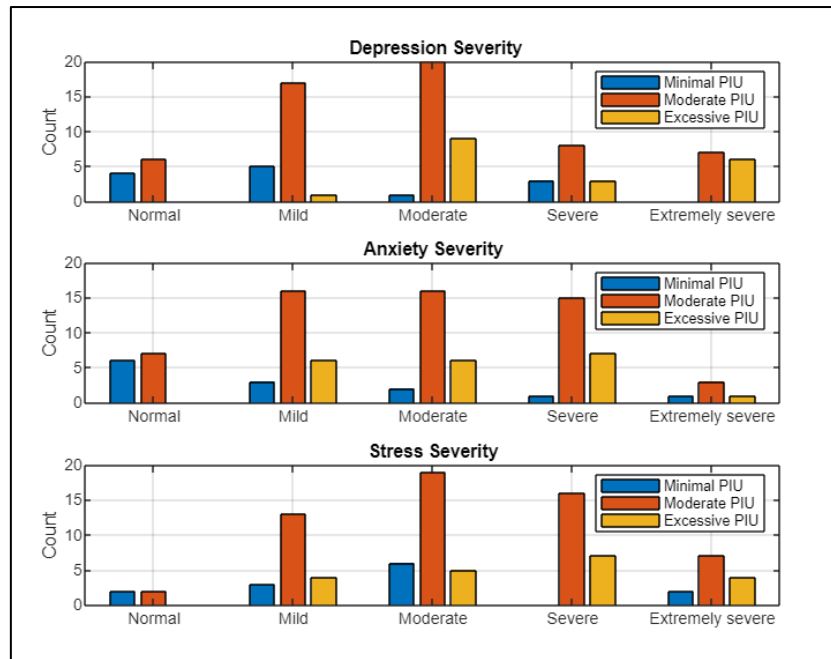
Figure 5: Impact of Depression, Anxiety, and Stress Severity on Problematic Internet Use (N=90)

Highlights between problematic Internet use and varying levels of depression, anxiety, and stress. For depression, the chi-square value is 20.380 with a p-value of 0.009, indicating a significant association. Individuals with minimal Internet use generally reported lower levels of depression, whereas those with excessive use exhibited higher levels, particularly severe and extremely severe depression. Similarly, anxiety is significantly associated with problematic Internet use,

evidenced by a chi-square value of 16.159 and a p-value of 0.040. Participants with excessive Internet use experienced more severe anxiety. Stress also shows a significant correlation with problematic Internet use (chi-square = 14.734, p-value = 0.019), with those exhibiting excessive use reporting higher stress levels. These findings underscore the substantial impact of Internet use severity on mental health, with higher usage correlating with greater psychological distress.

Table 3: Regression coefficients of problematic Internet use

Variable	Unstandardized Coefficients		Standardized Coefficients	95.0% CI			*t*	*p*
	B	Std. Error	Beta	LL	UL			
(Constant)	25.970	17.459	0.108	-8.878	60.819		1.487	0.142
Profession	7.862	7.188	0.322	-6.485	22.210		1.094	0.278
Gender	9.738	3.527	-0.166	2.698	16.778		2.761	0.007
Age	-0.921	0.559	-0.050	-2.038	0.195		-1.647	0.104
Family type	-2.181	4.758	-0.033	-11.679	7.317		-0.458	0.648
Physical activity	-0.686	2.299	0.305	3.902	5.274		4.298	0.006
Social activity	-0.870	2.474	0.237	-5.808	4.068		-0.352	0.726
Daily Internet use	2.067	0.870	0.276	0.331	3.803		2.377	0.020
Depression	0.410	0.203	0.114	0.004	0.816		2.017	0.048
Anxiety	0.176	0.197	0.028	-0.218	0.570		0.894	0.375
Stress	0.043	0.229	0.108	-0.414	0.500		0.187	0.852

In combination, demographic and other mental health related variables accounted for 85.5% of the variability in Internet addiction, $R^2 = 0.855$, $F(10, 66) = 4.443$, p<0.001. From Table 8, we can see that, daily Internet use (beta = 2.067, p < 0.05) and depression (beta = 0.410, p < 0.05) are two significant predictors of Internet addiction. Indicating respondents with higher scores on these variables were expected to have higher problematic Internet use, after controlling for the other variables in the model. Gender was another significant

predictor (beta = 9.738, p <0 .05) in model, that indicates males are expected to have more problematic Internet use score than females controlling other variables in the model. Physical activity was another significant predictor (beta = -0.686, p <0 .05) of problematic Internet use. Respondents with less physical activity were expected to have more problematic Internet use score than those who does more physical activity, controlling for other variables in the model.

DISCUSSION

This study was designed to assess the relationship between depression, anxiety, and stress with problematic Internet use (PIU) among youth and to examine whether socio-demographic variables were linked to an increased risk of PIU [11]. The study sample consisted of 90 individuals with PIU, drawn from the Outpatient Department, CAMH Clinic, and De-addiction Clinic of the Department of Psychiatry, BSMMU, Dhaka. This discussion highlights the principal findings, compares them with existing literature, and considers their practical implications.

The participants had a mean age of 21.33 years (SD ± 2.505), which aligns with findings from another research. For instance, found a higher prevalence of PIU among individuals with a mean age of 18.18 years (Range: 18–21; SD: 0.41). The rise in Internet use among youth in Bangladesh can be attributed to the expanded mobile broadband coverage, the proliferation of smartphones, and the reduction in Internet costs [12]. This demographic is less likely to receive parental guidance compared to school-aged children, potentially contributing to the observed PIU rates.

The gender distribution in our study revealed that 67.7% of participants were male and 32.2% were female. Among males, 67.2% had moderate PIU and 24.6% had excessive PIU, whereas among females, 51.7% had moderate PIU and 17.2% had excessive PIU. This suggests a higher prevalence of excessive PIU in males, which is consistent with other studies (e.g., Males often exhibit higher levels of sensation seeking and are more likely to engage in addictive behaviours such as online gaming and pornography, which may explain their increased risk of PIU. Contrastingly, some studies have reported higher PIU rates among females, though this difference may be influenced by study size or reporting biases [13]. Additionally, females may delay seeking help or disclose their symptoms less readily due to social stigma.

In terms of occupation, most participants were students (95.5%), with a smaller proportion being job holders (3.3%) or unemployed (1.1%). Consistent with other studies, students exhibited a higher prevalence of PIU. Among student participants, 60.4% had moderate PIU and 23.2% had excessive PIU. Although the sample size was small, the unemployed participant's excessive PIU might suggest a potential link between unemployment and increased Internet use [14]. Conversely, job holders in this study did not show a significant risk of excessive PIU. Regarding family type, 87.8% of participants came from nuclear families, and 12.2% from joint families. Participants from nuclear families showed a higher likelihood of developing PIU, which might indicate that family structure and dynamics play a role in PIU risk [15]. This aligns with findings suggesting that family support and bonding can serve as protective factors against PIU.

Most participants (83.3%) had been using the Internet for over a year, with a significant number using it for more than three hours daily. This supports findings by and other indicating a positive association between prolonged Internet use and PIU. Participants in our study who used the Internet for extended periods showed higher levels of moderate to excessive PIU, consistent with earlier research indicating that longer Internet use correlates with increased PIU [16]. Our study's prevalence rates for PIU were minimal (15.5%), moderate (62.2%), and excessive (22.2%). These findings are comparable to those reported in Bangladesh and across Southeast Asia [17]. The growing prevalence of PIU highlights the need for clinical attention as Internet use continues to escalate.

Participants ranked their Internet use purposes as follows: social media (4.84), chatting (4.52), entertainment (4.03), gaming (2.92), study (2.49), shopping (1.27), and other uses (0.93). These findings are consistent with previous research on Internet use patterns [18]. Higher PIU scores were associated with activities such as social networking, chatting, gaming, shopping, and viewing pornography, supporting similar findings. Most participants used mobile phones or tablets for Internet access, with minimal use of personal computers or cyber cafés.

To address the main objective, we explored the prevalence of depression, anxiety, and stress among PIU patients using the DASS-21-BV scale. Our results showed mean scores of 20.02 (depression), 20.50 (anxiety), and 24.58 (stress), with varying levels of severity reported. Significant associations were found between PIU and depression (χ^2=20.380; p=0.001), anxiety (χ^2=16.159; p=0.019), and stress (χ^2=14.734; p=0.019), indicating that higher levels of PIU are linked to increased levels of these psychological conditions. These findings are corroborated by studies highlighting the relationship between Internet addiction and mental health issues such as depression, anxiety, and stress [19].

Pearson correlation analysis revealed moderate positive correlations between PIU and depression (r = 0.569), anxiety (r = 0.534), and stress (r = 0.529), as well as strong correlations among these psychological conditions themselves. These results align with other studies indicating significant relationships between PIU and mental health disorders. Regression analysis identified sex, physical activity, daily Internet use duration, and depression as significant predictors of PIU. This supports previous findings linking PIU to factors such as gender, Internet use duration, and emotional distress [20]. Given the cross-sectional nature of this study, further longitudinal research is needed to explore these associations more deeply and to develop targeted interventions. In our study underscores the significant association between PIU and psychological conditions such as depression, anxiety, and stress, as well as the influence of socio-demographic factors. These findings

highlight the need for preventive measures and therapeutic strategies to address PIU and its associated mental health challenges.

CONCLUSION

This study indicates depression, anxiety, and stress are significantly associated with problematic internet use. Findings revealed that about one-fourth of patients have excessive PIU and depression, anxiety, and stress at severe and extremely severe levels. Male gender, higher frequency of using the internet have an important role to develop PIU with an elevated risk of arising depression, anxiety, and stress. So, proper use of the internet, early risk assessment, and initial screening all will lead to the intervention and management of potential mental disorders associated with problematic internet use.

Recommendations

- Problematic Internet use is common among youth patients now-a-days, so patients should be routinely asked about any inappropriate or addictive use of the Internet. Symptoms of depression, anxiety, and stress should also be checked.
- Youth could be taught to use the Internet responsibly and parents would be able to identify any problematic Internet use with this scientific evidence
- Health professionals should be aware to identify the presence of problematic Internet use or any risk factors for proper management or better prognosis.
- Future studies at the community level are recommended to get a more pragmatic and population-level picture.
- Future studies could use this study to evaluate any change and identify other variables affecting either Internet use or the other mental disorders with problematic use of the Internet. It may also be possible to develop an appropriate screening, evaluation and treatment plan for the PIU.

Article at a Glance
Study Purpose

To examine how depression, anxiety, and stress relate to problematic Internet use (PIU) in youth and to identify socio-demographic risk factors.

Key Findings

PIU is strongly linked with higher levels of depression, anxiety, and stress. Males show a higher rate of excessive PIU, and daily Internet use over three hours correlates with more severe PIU.

Newer Findings Added to What is Known

This study highlights the significant impact of prolonged Internet use and gender on PIU, contributing new insights into the mental health and behavioral patterns among Bangladeshi youth.

Abbreviations

PIU - Problematic Internet Use
DASS 21 - Depression, Anxiety, and Stress Scale 21
BSMMU - Bangabandhu Sheikh Mujib Medical University
CAMH - Child and Adolescent Mental Health
SD - Standard Deviation
χ^2 - Chi-Square
r - Pearson Correlation Coefficient

Conflict of interest: None declared

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