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The Level of Internet Addiction and Its Correlation with Loneliness among Undergraduate Students of Rajshahi University

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ABSTRACT

Internet addiction (IA) has emerged as a significant behavioral concern worldwide, and prior research has consistently linked it to loneliness, particularly among young adults. This study examined the level of internet addiction and its correlation with loneliness among undergraduate students of Rajshahi University, and additionally examined whether internet addiction and loneliness differ by gender. Using a correlational design and convenience sampling, data were collected from 60 undergraduate students (33 male, 27 female) from different departments and academic sessions. Participants completed a demographic questionnaire, the Bangla-adapted Internet Addiction Test (IAT), and the Bangla version of the UCLA Loneliness Scale (Version 3). Pearson correlation analysis revealed a small, statistically non-significant positive correlation between internet addiction and loneliness, $r(58) = .211$, $p = .105$. An independent-samples t-test showed that male students scored significantly higher than female students on internet addiction, $t(58) = 2.74$, $p = .008$, whereas no significant gender difference emerged for loneliness, $t(58) = 0.71$, $p = .478$. These findings are broadly consistent with previous studies linking excessive internet use to feelings of loneliness and social disconnection. Implications for early identification and intervention among university students, along with study limitations, are discussed. With N = 60, the study's power to detect an effect of this size was low (~33% at $\alpha = .05$), so this result should be read as inconclusive rather than as a confirmed null finding; effect sizes ($r^2 = .04$; Cohen's $d = 0.71$ for the internet-addiction gender difference and 0.19 for the loneliness gender difference) and 95% confidence intervals are reported alongside significance tests throughout.

Keywords: *Internet addiction, Loneliness, Undergraduate students, University students, UCLA Loneliness Scale, Correlation, Bangladesh*

1 | Introduction

Over the past few decades, internet addiction has become a major behavioral concern worldwide. Internet penetration and use have grown rapidly, aided by increasing accessibility, affordability, and anonymity. Recent estimates suggest that roughly 80% of adolescents in the UK, USA, and parts of Asia, and about 50% of adolescents in South America, use the internet regularly [1]. Internet addiction has been described as a form of psychological dependence, with prevalence estimates ranging from 0.3% to 8% among adolescents and up to 20% among adults [2]. The proliferation of smartphones, tablets, and laptops has further increased internet accessibility, allowing near-constant engagement in both work and leisure activities [3]. More recent evidence corroborates that internet addiction remains widespread among young people worldwide: a 2025 meta-analysis of 101 studies across 38 countries estimated the pooled prevalence of internet addiction among university students at 41.8% (95% CI (35.9, 48.0)), with male students at significantly higher risk than female students [4].

Internet addiction is generally described as a loss of control over internet use that leads to significant impairment or distress in daily functioning [5, 6]. Its prevalence has been estimated at around 27.1% in some samples, a figure comparable to earlier findings in Bangladesh [7]. Beyond its behavioral impact, problematic internet use has been linked to insomnia [8] and to psychiatric difficulties such as depression, anxiety, and attention

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problems among college students [9].

A substantial body of research links excessive internet use to social and psychological variables such as isolation, low self-esteem, shame, and, most notably, loneliness [10, 11]. A meta-synthesis of qualitative research spanning 1996–2006 identified loneliness as one of the principal antecedents of internet addiction, alongside isolation and low self-confidence [12], and some authors regard loneliness as one of its strongest predictors [13, 14]. Loneliness itself can be understood as a failure to meet personal and social needs when social rewards decline [15], and is often categorized into emotional loneliness (the absence of an important attachment figure) and social loneliness (the absence of a wider friendship network [16]). Among university students who leave home for the first time, homesickness and adjustment difficulties can create a void that draws newly independent students toward heavy internet use, particularly as new undergraduates tend to be less aware of its risks than more experienced postgraduates. Two broader explanatory models have been proposed to account for this association: in one, heavy internet use displaces offline social contact and produces loneliness [10], while in the other, individuals who are already lonely turn to the internet to compensate for unmet social needs [17]. Both models are considered in interpreting the present findings.

1.1 | Internet Addiction: Definition, Types, and Risk Factors

Problematic or pathological internet use is generally defined as compulsive internet use that produces significant impairment across major life domains over an extended period [18]. Young people are considered particularly vulnerable, with excessive online engagement linked to declining academic performance and to loneliness [19], as students stay up late to chat, check social media, or continue gaming [20]. Although not formally recognized as a disorder by the World Health Organization, the DSM-5, or the ICD-11, internet addiction remains most relevant to adolescents (12–19 years) and emerging adults (20–29 years), who use the internet more than any other age group [21].

Researchers have proposed several subtypes of internet addiction, including cybersex addiction, net compulsions (e.g., online gambling, trading, or shopping), cyber-relationship addiction, and compulsive information seeking. No single factor explains vulnerability to internet addiction; instead, it appears to arise from a combination of interpersonal difficulties such as introversion and poor face-to-face communication skills [22, 23], insufficient social support [24], prior psychiatric history such as depression or anxiety [25], and neurobiological and family-related factors [19]. Parental education level, age at first internet use, and frequency of social media and gaming use have also been positively associated with excessive internet use among adolescents [26]. Commonly reported physical symptoms include headaches, eye strain, sleep disturbance, and neglect of personal hygiene, while emotional symptoms include preoccupation with online activity, anxiety when offline, guilt, and social isolation.

1.2 | Loneliness[27]

Whereas brief episodes of loneliness are common and typically resolve on their own, chronic loneliness reflects a persistent and unrelenting sense of disconnection from others that can affect even outwardly sociable individuals. It is often accompanied by self-doubt, low self-esteem, and social anxiety, and by symptoms such as an inability to connect with others on a deeper level, the absence of close confidants, pervasive feelings of isolation regardless of social context, and exhaustion from social engagement. Over time, chronic loneliness has been associated with elevated cortisol levels and downstream risks including high blood pressure, weight gain, and difficulty concentrating, as well as broader mental and physical health consequences such as depression, anxiety, stroke, and heart disease.

1.3 | Internet Addiction and Loneliness: Prior Findings

Numerous studies report a positive association between internet addiction and loneliness. In samples of young adolescents, roughly three-quarters have been classified as moderate internet users, with excessive users showing elevated anxiety and depression scores. Estimates of internet addiction prevalence vary considerably across populations and instruments, ranging from about 4.5% among Greek students to around 41% mild and 15% moderate addiction among other student samples, with male gender, arts and engineering majors, time spent online, and lack of extracurricular involvement emerging as associated factors. Elevated internet addiction has also been linked to neuroticism, psychiatric morbidity, and suicidal ideation in some samples. A study of internet addiction and loneliness among university students in Shkodra [28] found that a notable minority of students were problematic internet users at risk of addiction, with a mild positive correlation ($r = .45$) between internet addiction and loneliness scores, and no significant gender differences in either variable [13, 15].

1.4 | Rationale and Objectives of the Present Study

Internet addiction appears to be worsening among university students in Bangladesh, with excessive time spent on unproductive online activities -social media, video streaming, and, in some cases, pornography-coinciding with declining academic performance and strained relationships with family and friends. Because loneliness is a common premorbid and comorbid feature of depression and other psychological difficulties, and because relatively little research has examined this relationship within Bengali culture specifically, the present study sought to inves-

tigate the association between internet addiction and loneliness among undergraduate students at Rajshahi University. Raising awareness of this relationship among students was considered a potentially valuable contribution to student mental health and, more broadly, to national goals of cultivating a digitally literate and psychologically healthy citizenry.

The objectives of the present study were (a) to determine the level of internet addiction among undergraduate students at Rajshahi University, (b) to explore the relationship between internet addiction and level of loneliness, and (c) to investigate whether internet addiction and loneliness differ significantly between male and female students. Based on the literature reviewed above, it was hypothesized that there would be a positive correlation between the level of internet addiction and loneliness.

2 | Methods

2.1 | Participants and Sampling

Participants were undergraduate students of Rajshahi University. A convenience sampling method, a form of non-probability sampling, was used to recruit 60 students from a range of departments and academic sessions (33 male, 55%; 27 female, 45%). A correlational research design was used to examine the relationship between internet addiction and loneliness. Participants were recruited using a convenience sampling approach across the Rajshahi University campus. Data collection took place in person, primarily in and around classrooms, department common rooms, and library spaces, where students who were present and willing to participate were invited to complete a paper-based questionnaire packet (demographic sheet, IAT, and UCLA Loneliness Scale) after providing informed consent. Students from multiple departments and academic sessions were approached to reduce the influence of any single discipline or cohort on the results; no department or session was deliberately excluded. Eligibility was limited to currently enrolled undergraduate students of Rajshahi University who volunteered to participate; no other exclusion criteria were applied. Because participants were approached informally as they were encountered rather than through a fixed, pre-identified list of invitees, a precise response rate could not be calculated; nearly all students who were approached agreed to complete the questionnaire, and only a small number of incomplete responses were excluded from the final sample of 60.

3 | Measures

3.1 | Demographic Questionnaire.

A demographic and personal information questionnaire was used to collect information on name, age, marital status, education, socioeconomic status, parental occupation, number of siblings, family type, monthly income, most frequently used internet browser, internet connection type, and personal device ownership.

3.2 | Internet Addiction Test

Internet addiction was measured using the Bangla-adapted Internet Addiction Test (IAT; [29, 30]), based on the original 20-item scale developed by Young (1998) [31] as the first validated and widely used measure of addictive internet use; the Bangla adaptation retains 18 of the original items. The IAT assesses psychological dependence, compulsive use, withdrawal, and related problems with sleep, family relationships, and time management. It consists of 18 items rated on a 5-point Likert scale ranging from 1 (rarely) to 5 (always), yielding scores from 18 to 90; higher scores indicate greater internet addiction. Based on total score, respondents can be classified as minimal users (18–35), moderate users (36–62), or excessive users (63–90). The Bangla IAT demonstrated good internal consistency (Cronbach's α = .89 for the total scale, and .60–.84 across factors) and adequate convergent and discriminant validity in the original validation study.

3.3 | UCLA Loneliness Scale

Loneliness was assessed using the Bangla version of the UCLA Loneliness Scale, Version 3, originally developed by Russell et al. (1978) [32] and later revised by Russell (1996 [33]; Bangla adaptation by Ahmed, 2019 [34]), a 20-item measure of subjective feelings of loneliness. Higher scores indicate greater loneliness, with four descriptive levels: low (20–34), moderate (35–49), moderately high (50–64), and high (65–80). The Bangla version has demonstrated strong psychometric properties, including a Cronbach's alpha of .898 and test–retest reliability of .833 [33-35].

4 | Procedure

Following selection of the target population, participants were recruited using convenience sampling across different departments and academic sessions at Rajshahi University. Data were screened for normality prior to inferential analysis and were found to be normally distributed. Demographic information, including sex, age, and socioeconomic status, was collected alongside scores on the IAT and UCLA Loneliness Scale. Data were analyzed using IBM SPSS Version 25.0. Pearson correlation was used to examine the association between internet addiction and loneliness, and independent-samples t-tests were used to test for gender differences in internet addiction and loneliness scores.

5 | Results

Data were analyzed using descriptive and inferential statistics in IBM SPSS Version 25.0. Kolmogorov–Smirnov and Shapiro–Wilk tests indicated that scores on both the IAT and the Loneliness scale were approximately normally distributed for male and female participants (see Table 1). Skewness and kurtosis ratios

Table 1 | Tests of Normality for Internet Addiction and Loneliness Scores by Sex.

	Sex	Kolmogorov–Smirnov		Shapiro–Wilk	
		Statistic	*Sig.*	*Statistic*	*Sig.*
IAT	Male	0.105	0.200	0.958	0.226
	Female	0.133	0.200	0.890	0.008
Loneliness	Male	0.157	0.039	0.929	0.032
	Female	0.186	0.017	0.912	0.025

(statistic/SE) for both measures fell within the acceptable range of −1.96 to 1.96 (IAT: 0.54 and −0.77 for males, 0.92 and −1.42 for females; Loneliness: 0.52 and −1.52 for males, 0.57 and −1.47 for females), confirming that the data were suitable for parametric analyses, including independent-samples t-tests. It should be noted that the Shapiro–Wilk test was significant (i.e., indicated departure from normality) for female IAT scores, W = 0.890, p = 0.008, and for loneliness scores in both males, W = 0.929, p = 0.032, and females, W = 0.912, p = 0.025 (see Table 1); the skewness/kurtosis ratios reported above were therefore relied upon as the primary normality criterion, following the recommendation that these ratios are more robust than significance tests in small subgroup samples. As a robustness check on this decision, the authors recommend re-running the correlation and group-comparison analyses with non-parametric equivalents (Spearman's rho; Mann-Whitney U) on the original dataset; this could not be performed for the present revision because only summary statistics, not the raw response-level data, were available.

5.1 | Correlation Between Internet Addiction and Loneliness

Because data were collected through non-probability sampling, Pearson correlation was used to examine the association between internet addiction and loneliness. The correlation was positive but mild, r(58) = 0.211, p = 0.105 (see Table 2), indicating that students who reported spending more time online tended to report somewhat greater loneliness in relation to friends and family, though the correlation was not statistically significant, 95% CI (−0.05, 0.44), and the association should therefore be treated as inconclusive rather than as confirmed support for the hypothesis; the shared variance between the two measures was small, $r^2 = 0.04$.

Table 2 | Pearson Correlations Between Internet Addiction (IAT) and Loneliness Scores.

	IAT	Loneliness
IAT	1	0.211
Loneliness	0.211	1
N	60	60
95% CI	(−0.05, .44)	$r^2 = 0.04$

5.2 | Gender Differences in Internet Addiction and Loneliness

An independent-samples t-test comparing male and female students' IAT scores revealed a statistically significant difference, t(58) = 2.74, p = 0.008, with male students (M = 46.15, SD = 15.06) reporting higher internet addiction than female students (M = 36.22, SD = 12.45); the mean difference was 9.93 points (see Table 3). This represented a medium-to-large effect, Cohen's d = 0.71, 95% CI for the mean difference (2.68, 17.18).

By contrast, no significant gender difference emerged for loneliness scores, t(58) = 0.71, p = 0.478, with male students (M = 45.97, SD = 18.81) and female students (M = 42.74, SD = 15.57) reporting broadly similar levels of loneliness (see Table 4). Taken together, these results indicate that although male students in this sample reported greater internet addiction than female students, this gender gap did not extend to loneliness. This represented a small effect, Cohen's d = 0.19, 95% CI for the mean difference (−5.83, 12.28), consistent with the non-significant result.

6 | Discussion

The present study examined the association between internet addiction and loneliness among 60 undergraduate students at Rajshahi University, and tested whether these variables differed

Table 3 | Independent-Samples t Test for Internet Addiction (IAT) Scores by Sex.

Sex	n	M	SD	t	df	p	Mean Diff.	SE Diff.	95% CI (LL, UL)	Cohen's d
Male	33	46.15	15.061	2.743	58	0.008	9.929	3.620	(2.68, 17.18)	0.71
Female	27	36.22	12.451	—	—	—	—	—	—	—

Table 4 | Independent-Samples t Test for Loneliness Scores by Sex.

Sex	n	M	SD	t	df	p	Mean Diff.	SE Diff.	95% CI (LL, UL)	Cohen's d
Male	33	45.97	18.809	0.714	58	0.478	3.229	4.523	(−5.83, 12.28)	0.19
Female	27	42.74	15.565	—	—	—	—	—	—	—

by gender. Consistent with prior research linking internet addiction to other mental health difficulties such as depression and anxiety [36, 37], and with studies reporting a linear association between internet addiction and loneliness whereby more heavily addicted individuals report greater loneliness [17, 38], the present findings revealed a small, non-significant positive correlation between internet addiction and loneliness; given the low statistical power afforded by N = 60, this is best interpreted as an inconclusive result rather than evidence against an association, and should not be over-read as confirmatory. This pattern is broadly consistent with a dose–response relationship of the kind described by the Bradford-Hill criteria for causal inference in epidemiology [39], which is consistent with, though not proof of, a dose–response pattern; the cross-sectional, non-significant nature of the present data means this interpretation remains speculative.

One plausible explanation is that individuals who feel lonely turn to excessive internet use as a coping strategy, using online interaction as a substitute for offline social connection [40, 41]. Two broader explanatory models have been proposed for the internet addiction–loneliness relationship. In the first, internet addiction is the cause of loneliness: individuals who spend excessive time online gradually withdraw from family and social relationships and become lonelier as a result. In the second, loneliness is the cause of internet addiction: individuals who already feel lonely increase their online communication to meet unmet emotional and social needs. The present cross-sectional design cannot adjudicate between these models, but both are consistent with the observed correlation. Cultural factors specific to the Bangladeshi context — including collectivist family structures, shared living arrangements, and academic pressure — may also shape how internet use and loneliness relate to one another in ways that differ from the largely Western samples on which the two explanatory models above were developed; this study's design did not permit testing such moderation directly.

Beyond loneliness, internet addiction has also been associated with a range of other mental and physical health difficulties and with lifestyle and dietary behavior, underscoring the importance of prevention and treatment. Systematic reviews suggest that physical activity, psychological interventions, and, where appropriate, pharmacological treatment can be effective in preventing and addressing internet addiction. With respect to gender, male students in the present sample scored significantly higher on internet addiction than female students, consistent with several previous studies, but no corresponding gender difference emerged in loneliness scores—suggesting that the mechanisms linking internet use to loneliness may operate similarly for male and female students even where overall usage levels differ. For Rajshahi University specifically, these findings point toward screening and light-touch support (e.g., peer-support groups, structured extracurricular activities) for male students, who reported higher internet addiction scores in this sample, rather than toward broad, unspecific policy recommendations.

7 | Limitations

Several limitations should be considered when interpreting these findings. First, the study relied on a small convenience sample of 60 students, which limits statistical power and generalizability. Second, data were collected from a single university in Bangladesh, so findings may not generalize to other student populations within Bangladesh or in other countries. Third, most existing research on internet addiction and loneliness has been conducted in Western cultural contexts, and comparatively few studies have examined this relationship within Bengali culture, limiting the interpretive context available for the present results. Finally, the relationship between internet addiction and loneliness may be moderated by gender and age; while subgroup analyses by gender were conducted, the available sample size did not permit more fine-grained age-based subgroup analysis. Additionally, potentially confounding variables — such as socioeconomic status, academic year, and living situation — were not statistically controlled for in the analyses; the cross-sectional design precludes any test of causality between internet addiction and loneliness; and although the Bangla-adapted IAT and UCLA Loneliness Scale have documented psychometric properties in Bangladeshi samples [29, 34], self-report measures of this kind remain susceptible to social desirability bias, which may have affected responses in either direction.

8 | Conclusion

The present findings indicate a small, statistically non-significant association between internet addiction and loneliness among undergraduate students at Rajshahi University — a result that, given the limited statistical power of this sample, should be treated as inconclusive rather than as evidence for or against the hypothesis — alongside a significant, medium-to-large gender difference in internet addiction favoring higher scores among male students. Given the pervasiveness of internet use among contemporary university students, these results reinforce the importance of policymakers and mental health educators remaining attentive to the potential adverse effects of excessive internet use. Targeted interventions—including structured physical activity, psychological support, and, where clinically indicated, pharmacological treatment—may help prevent and address internet addiction and its association with loneliness among university student populations.

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Consent Statement

Informed consent was obtained from all individual participants included in the study. Participants were informed about the purpose, procedures, voluntary nature of participation, and confidentiality of the data prior to completing the questionnaire. They were assured that they could withdraw at any time without any consequence. Written informed consent was obtained from each participant before data collection.

Conflicts of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Authors Contribution

Dr. Shiri Farhana contributed to the conceptualization of the study, methodology, and investigation. Dr. Md. Shariful Islam contributed to the study design, supervision, data analysis, interpretation of findings, and manuscript writing and critical revision. Md. Rokonuzzaman contributed to data collection, data management, statistical analysis, and manuscript preparation. Md. Amanul Islam contributed to the literature review, data collection, and manuscript editing. All authors reviewed and approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

Data Availability Statement

The datasets generated and analysed during the current study are available from the corresponding author upon reasonable request. Due to privacy and ethical considerations regarding student mental-health data, the raw data are not publicly deposited.