

Research Paper

The Mediating Role of Self-Esteem in the Relationship Between Internet Addiction and Depression among University Students

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ABSTRACT

This study examines the mediating role of self-esteem in the relationship between internet addiction and depression among university students. A total of 352 students (187 female, 165 male) from Gopalganj Science and Technology University were selected through convenience sampling. Data were collected using the Bangla version of Internet Addiction Test (IAT), Rosenberg Self-Esteem Scale (RSES), and Patient Health Questionnaire-9 (PHQ-9). Data were analyzed using SPSS 27, employing Pearson correlation, independent samples t-tests, and mediation analysis via Hayes' Process Macro 4.2. Results indicated a significant negative correlation between internet addiction and self-esteem, and between self-esteem and depression, while internet addiction was positively correlated with depression. Mediation analysis demonstrated that self-esteem partially mediated the relationship between internet addiction and depression, suggesting that internet addiction reduces self-esteem, which in turn increases depressive symptoms. These findings highlight the importance of addressing self-esteem in interventions targeting internet addiction to mitigate its psychological consequences. Future research should explore additional mediators and causal relationships to strengthen understanding in this area.

Keywords: *Internet Addiction, Self-esteem, Depression, Mediation, University Students*

In contemporary society, the pervasive integration of the internet into daily life has revolutionized communication, education, and entertainment, yet it has also engendered a spectrum of challenges, notably the escalating prevalence of internet addiction among university students (Koo & Kwon, 2014). This phenomenon, characterized by excessive or poorly controlled preoccupations, urges or behaviors regarding mobile phone use, computer use and internet access that lead to impairment or distress (Spagnolo & Northoff, 2021), has garnered increasing attention due to its potential ramifications for mental health, particularly depression (Koo & Kwon, 2014). Depression, a complex and debilitating mood disorder, manifests in university students through a constellation of symptoms that extend beyond transient feelings of sadness, encompassing persistent anhedonia, cognitive impairments affecting concentration and decision-making, alterations in sleep patterns, appetite dysregulation, feelings of worthlessness, and, in severe cases, the emergence of suicidal thoughts and behaviors (Runnels, 2008). The co-occurrence of internet addiction and

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depression among university students presents a particularly salient concern, exacerbated by the unique stressors inherent to the academic milieu; the confluence of demanding curricula, financial pressures, social adaptation challenges, and anxieties regarding future career prospects creates a fertile ground for the development and exacerbation of mental health issues (Runnels, 2008).

Accumulating empirical research underscores a salient correlation between the propensity for internet addiction and the presentation of depressive symptomatology, as evidenced by numerous studies demonstrating a statistically significant positive relationship between these constructs; this suggests that heightened engagement in excessive or uncontrolled internet usage may serve as a harbinger for, or a concomitant manifestation of, underlying depressive tendencies (Koo & Kwon, 2014). Extensive research suggests a strong correlation between internet addiction and depression among university students, with studies consistently demonstrating that individuals with higher levels of internet addiction exhibit a greater propensity for experiencing depressive symptoms (Akhtar & Khan, 2019). The accessibility and utility of the internet are undeniably crucial for academic pursuits, yet excessive and uncontrolled internet use can lead to detrimental consequences, including psychological distress and impaired well-being (Mboya et al., 2020). This bidirectional relationship implies that pre-existing depression can exacerbate internet addiction, while conversely, excessive internet use can precipitate or worsen depressive symptoms (Koo & Kwon, 2014). However, the precise mechanisms through which internet addiction contributes to depression remain unclear, necessitating a deeper exploration of potential mediating variables that might elucidate this intricate relationship; specifically, this study aims to investigate the potential mediating role of self-esteem in the relationship between internet addiction and depression among university students.

Self-esteem, a dynamic psychological construct, reflects an individual's overall sense of self-worth and acceptance, serving as a crucial mediator between external experiences and internal emotional states (Landa-Blanco et al., 2024). Individuals with robust self-esteem tend to exhibit greater resilience when confronted with stressful life events, effectively employing adaptive coping strategies and maintaining a positive outlook, whereas those with diminished self-esteem are more susceptible to the detrimental effects of stress, increasing their vulnerability to the emergence of psychological maladjustment and the exacerbation of affective disorders, including depressive syndromes. (Spagnolo & Northoff, 2021). Within the context of internet addiction, compromised self-esteem can act as a potent catalyst, fueling the addictive cycle through multiple pathways; individuals struggling with feelings of inadequacy may seek refuge and compensatory gratification in online activities, substituting virtual interactions for real-world connections, potentially exacerbating feelings of isolation and loneliness, which, in turn, further erode self-esteem and amplify the risk of depressive symptoms (Koo & Kwon, 2014). Furthermore, negative self-evaluations have been linked to addictive behaviors, where individuals may use addictive substances or behaviors to escape or withdraw from their emotions (Niemz et al., 2005).

Several theoretical frameworks provide a foundation for understanding the intricate relationships between internet addiction, self-esteem, and depression. Attachment theory, with its emphasis on the formative influence of early relationships, offers valuable insights into the development of self-esteem and its subsequent impact on mental health; individuals with secure attachment styles, characterized by consistent and responsive caregiving experiences, tend to develop a positive sense of self, fostering resilience and adaptive coping

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mechanisms, whereas those with insecure attachment styles, marked by inconsistent or neglectful caregiving, may struggle with low self-esteem and heightened vulnerability to psychological distress (Sokar, 2024). Moreover, the cognitive-behavioral model posits that maladaptive thought patterns and behaviors contribute to the perpetuation of both internet addiction and depression; specifically, negative self-appraisals, dysfunctional beliefs regarding one's capabilities and inherent worth, and the habitual engagement in systematic cognitive distortions, operationalized as the consistent application of thought patterns such as catastrophizing (where individuals consistently overestimate the potential for negative outcomes and their severity) and overgeneralization, elevate the propensity for the manifestation of depressive symptoms (Sokar, 2024). The empirical evidence and theoretical frameworks provide a robust rationale for examining the mediating role of self-esteem in the relationship between internet addiction and depression.

The conceptual framework of this study is as follows:

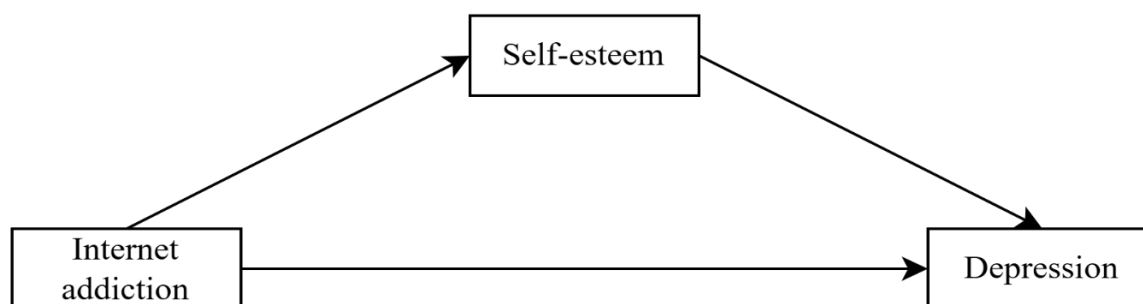


Figure 1. Conceptual Model

Although the bidirectional relationship between internet addiction and depression has been documented globally, there is a lack of empirical evidence from developing countries like Bangladesh, where cultural, social, and academic pressures may uniquely influence this association. Furthermore, the role of self-esteem as a potential mediator in this relationship has not been sufficiently explored within this population in Bangladesh. Therefore, conducting this study in the Bangladeshi context will help bridge the research gap and provide culturally relevant insights that could inform mental health interventions and policy development targeting young adults in academic settings.

Objective of the study

The objective of this study was to investigate the mediating role of self-esteem in the relationship between internet addiction and depression among university students.

METHODOLOGY

Sample

The study included a total of 352 participants from Gopalganj Science and Technology University, Bangladesh. Among them, 187 (53.1%) were female, and 165 (46.9%) were male ages ranging between 19 and 28 years ($M = 24.5$ years, $SD = 3.04$). The participants were selected using a convenience sampling method.

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Instruments

Age and gender were collected as demographic information of the participants. This study utilized three measures,

1. Internet Addiction Scale

Internet addiction was measured using the Internet Addiction Test (IAT), developed by Young (1998) and later adapted for the Bangladeshi context by Karim and Nigar (2014). The IAT consists of 18 items, rated on a 5-point Likert scale (1 = Very Rarely to 5 = Very Frequently). The total score ranges from 18 to 90, with higher scores indicating greater levels of internet addiction. The scale has demonstrated strong internal consistency, with a Cronbach's alpha of 0.89. In this study, Cronbach's alpha was 0.83, indicating good reliability.

2. Self-Esteem Scale

Self-esteem was assessed using the Rosenberg Self-Esteem Scale (RSES), originally developed by Rosenberg (1965) and later adapted by Akhter and Ferdous (2019) for use in the Bangladeshi population. The scale consists of 10 items, rated on a 4-point response format ranging from Strongly Disagree (1) to Strongly Agree (4). It includes five positive items (1, 2, 4, 6, 7) and five negative items (3, 5, 8, 9, 10), with negative items being reverse scored. The total score ranges from 10 to 40, where higher scores indicate greater self-esteem. The scale has demonstrated good internal consistency reliability (Cronbach's alpha = 0.86), and in this study, Cronbach's alpha was 0.81.

3. Depression Scale

Depressive symptoms were assessed using the Patient Health Questionnaire-9 (PHQ-9), developed by Kroenke et al. (2001) and later adapted by Naher et al. (2021). The PHQ-9 is a 9-item self-administered questionnaire designed to diagnose and assess the severity of depression over the past two weeks, based on DSM criteria for Major Depressive Disorder. Each item is scored from 0 (Not at all) to 3 (Nearly every day), with total scores ranging from 0 to 27, where higher scores indicate severe levels depression. The PHQ-9 has demonstrated good internal consistency, with a Cronbach's alpha of 0.84. In this study, Cronbach's alpha was 0.85.

Procedure

Data collection was conducted through self-reported questionnaires, which included demographic questions and the three psychometric scales (IAT, RSES, and PHQ-9). Participants were provided with clear instructions before completing the survey. The questionnaires were administered in a classroom setting, and participants were given adequate time to respond.

Data processing and analyses

Data analysis was conducted using SPSS (Statistical Package for the Social Sciences), version 27. Descriptive statistics (means, standard deviations, frequencies and percentage) were calculated to summarize participant characteristics. To examine the relationships between the main variables Pearson product-moment correlation was conducted.

Independent samples t-test was conducted to compare gender differences in Internet addiction, self-esteem, and depression. Additionally, mediation analysis was performed using Hayes' Process Macro 4.2 to examine the indirect effects of self-esteem and depression on internet addiction.

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Ethical Considerations

Participants were informed about the purpose of the study, their right to withdraw at any time, and the confidentiality of their responses. Written informed consent was obtained before participation. No personally identifiable information was collected to ensure anonymity.

RESULTS

Before applying inferential statistics, the normality of the collected data on internet addiction, self-esteem and depression scores was checked. Regarding the Shapiro-Wilk and Kolmogorov-Smirnov test, p values are above .05 indicating the variables are normally distributed (Goodman, 1954). independent sample t-test was carried out to check whether gender significantly varied with the variables. The analysis revealed no significant ($p > .05$) difference observed in internet addiction, self-esteem and depression regarding gender.

Table 1 Correlation Matrix of Internet Addiction, Self-Esteem, and Depression

Variables	1	2	3
1. Internet Addiction	-		
2. Self-Esteem	-.22**	-	
3. Depression	.22**	-.32**	-

Note. $N = 352$. ** $p < .01$

Table 1 presents the correlation matrix for internet addiction, self-esteem, and depression. The results indicate a significant negative correlation between internet addiction and self-esteem ($r = -.22, p < .01$), suggesting that higher internet addiction is associated with lower self-esteem. Similarly, self-esteem and depression are significantly negatively correlated ($r = -.32, p < .01$), indicating that lower self-esteem is associated with higher levels of depression. On the other hand, internet addiction is significantly positively correlated with depression ($r = .22, p < .01$), meaning that individuals with higher internet addiction tend to report higher levels of depression.

Table 2 Mediation Analysis of the Model

Path	<i>B</i>	β	<i>SE</i>	<i>t</i>	<i>p</i>	95% <i>CI</i>	
						<i>UL</i>	<i>LL</i>
a: Internet addiction → Self-esteem	-0.06	-0.22	0.01	-4.31	<.001	-0.08	-0.03
b: Self-esteem → Depression	-0.22	-0.28	0.04	-5.49	<.001	-0.30	-0.14
c (total): Internet addiction → Depression	0.05	0.22	0.01	4.29	<.001	0.02	0.07
c' (direct): Internet addiction → Depression	0.03	0.16	0.01	3.12	<.05	0.01	0.05
a*b (indirect): Internet addiction → Self-esteem → Depression	0.01	0.06	0.004	-	-	0.01	0.02

Note. *B* = unstandardized coefficient; β = standardized coefficient; *SE* = standard error; *CI* = confidence interval; *LL* = lower limit; *UL* = upper limit

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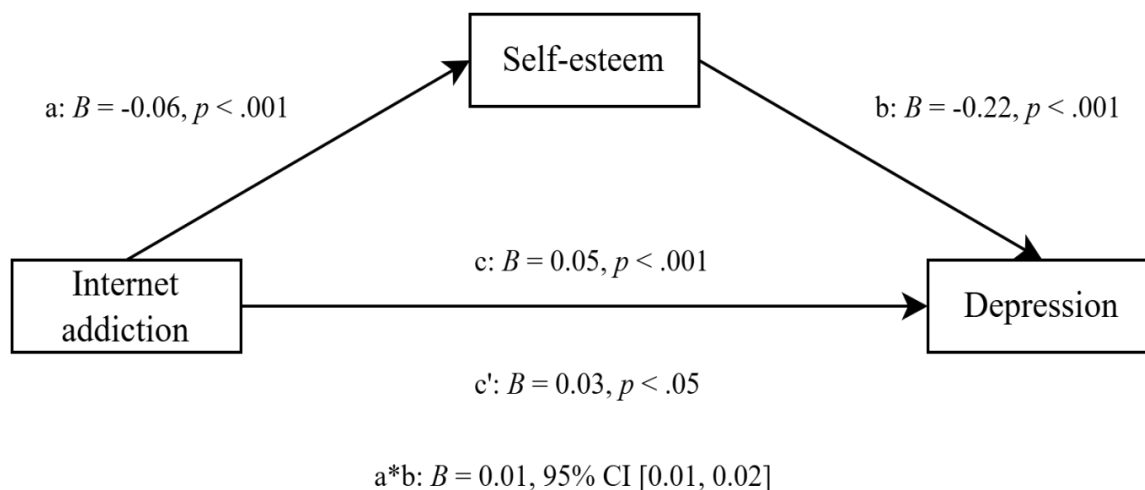


Figure 2: Mediation Analysis of Self-esteem between Internet Addiction and Depression

The mediation analysis results, as shown in Table 2 and Figure 2, indicate significant relationships between the variables involved. Specifically, there is a significant effect of internet addiction on self-esteem (path a; $B = -0.06, p < 0.001$), and a significant effect of self-esteem on depression (path b; $B = -0.22, p < 0.001$). Furthermore, the indirect effect of internet addiction on depression through self-esteem was also significant ($B = 0.01, 95\% \text{ CI } [0.01, 0.02]$). The direct effect of internet addiction on depression remained significant but was smaller ($B = 0.03, p < .05$). Overall, the total effect of internet addiction on depression was significant ($B = 0.05, p < 0.001$), indicating that self-esteem partially mediates the relationship between internet addiction and depression.

DISCUSSION

This study aimed to investigate the mediating role of self-esteem in the relationship between internet addiction and depression among university students. The finding reveals the significant negative effect of internet addiction on self-esteem suggests that heightened levels of internet addiction are associated with diminished self-esteem, potentially reflecting a tendency for individuals with excessive internet use to develop negative self-perceptions or experience a decline in their sense of self-worth, which could be attributed to factors such as adverse social comparison processes on social media platforms, a reduction in tangible accomplishments in offline domains, or the emergence of feelings of culpability and shame linked to their online behaviors (Walsh, 2014). This aligns with the notion that online activities, while potentially offering temporary gratification, can also lead to feelings of inadequacy or social comparison, ultimately diminishing self-esteem (Spagnolo & Northoff, 2021). Conversely, the significant negative effect of self-esteem on depression underscores the protective role of self-esteem against the onset or exacerbation of depressive symptoms, indicating that individuals with higher levels of self-esteem are less likely to experience depression, possibly due to their bolstered resilience in the face of adversity, more secure attachment styles that foster healthier interpersonal connections, and a greater sense of self-efficacy that empowers them to proactively address life's challenges (Spagnolo & Northoff, 2021). The observed negative effect of self-esteem on depression further supports the well-established link between low self-esteem and heightened depressive symptoms, indicating that individuals with lower self-esteem are more vulnerable to experiencing feelings of sadness, hopelessness, and a general lack of interest in life (Walsh, 2014).

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The finding of significant indirect effect of internet addiction on depression through self-esteem lends further credence to the proposed mediation model, suggesting that the detrimental impact of internet addiction on depression is partially mediated by its erosion of self-esteem (Wells & Fisher, 2016). This implies that individuals who are highly addicted to the internet may experience a decline in self-esteem, which, in turn, increases their susceptibility to depression, possibly as a consequence of the diminished capacity to cope with stress, an inclination to engage in negative self-evaluations that exacerbate feelings of inadequacy and worthlessness, and a heightened susceptibility to social estrangement and the emergence of affective disturbances (Koo & Kwon, 2014). Notably, the significant indirect effect of internet addiction on depression through self-esteem underscores the mediating role of self-esteem in this relationship, suggesting that the detrimental impact of internet addiction on depression is partially explained by its negative influence on self-esteem (Zhang et al., 2015). These findings find resonance within established theoretical frameworks, particularly those emphasizing the interplay between self-perception, social interaction, and psychological well-being. From the perspective of cognitive theories of depression, the observed relationships may be explained by the tendency for individuals with internet addiction to develop negative self-schemas, characterized by distorted and pessimistic beliefs about themselves and their capabilities, thereby increasing their vulnerability to depression (Koo & Kwon, 2014). Social comparison theory suggests that individuals with heightened internet use, particularly on social media platforms, may engage in upward social comparisons, leading to feelings of inferiority, dissatisfaction, and diminished self-esteem, which, in turn, contribute to the exacerbation of depressive symptomatology and a greater propensity for experiencing negative affective states (Gámez-Guadix, 2014).

Furthermore, the persistence of a significant direct effect of internet addiction on depression, even after accounting for the mediating influence of self-esteem, suggests that internet addiction exerts both direct and indirect effects on depression, which may involve mechanisms such as the disruption of sleep (Koo & Kwon, 2014), the potential substitution of online interactions for meaningful real-world relationships (Spagnolo & Northoff, 2021), or the activation of neural reward circuits that, over time, can contribute to emotional dysregulation and an increased susceptibility to depressive states. The substantial total effect of internet addiction on depression underscores the clinical relevance of addressing internet addiction as a potential risk factor for depression, and the partial mediation of self-esteem suggests that interventions designed to enhance self-esteem may serve as a protective factor against the development of depression in individuals grappling with internet addiction, or in other words, the enhancement of self-esteem in individuals struggling with internet addiction may serve as a protective mechanism against the emergence of depressive symptomatology (Gámez-Guadix, 2014).

This study has several limitations that should be acknowledged. First, the use of a convenience sampling method limits the generalizability of the findings, as the sample was restricted to university students from a single institution. Future research should incorporate more diverse populations to enhance external validity. Second, the reliance on self-reported data may introduce response biases, such as social desirability or recall bias, potentially affecting the accuracy of reported internet addiction, self-esteem, and depression levels. Third, the cross-sectional design precludes causal inferences, as the directionality of relationships cannot be definitively established. Longitudinal studies are recommended to explore the temporal dynamics between these variables.

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Despite these limitations, the findings have important implications. The results highlight the critical role of self-esteem in mitigating the negative psychological effects of internet addiction. Interventions aimed at enhancing self-esteem may serve as protective measures against depression among individuals with high internet addiction. Additionally, policymakers and mental health professionals should consider developing targeted programs to address excessive internet use and its psychological consequences in university settings.

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Conflict of Interest

The authors stated that there were no conflicts of interest.

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