



Research Article

THE TRIADIC ASSOCIATION OF SMARTPHONE ADDICTION, PSYCHOLOGICAL DISTRESS, AND SELF-EFFICACY AMONG ADOLESCENTS

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ABSTRACT

This study examined the relationships of smartphone addiction, psychological distress, and self-efficacy among Bangladeshi adolescents. A cross-sectional survey design was used to collect data from 320 school-going adolescents (160 girls and 160 boys) aged from 13 to 17 years ($M = 15.00$, $SD = 1.41$) in Dhaka. Convenience sampling techniques was used. Bangla version of Smartphone Addiction Scale (SAS), the General Self-Efficacy Scale (GSES), and the General Health Questionnaire-12 (GHQ-12) scales were used to collect data from the respondents. Obtained data were analyzed by employing descriptive statistics, correlation, t-test, and mediation analysis by Hayes' Process Macro with the help of SPSS 27 version. Results revealed that smartphone addiction was positively correlated with psychological distress ($r = .86$, $p < .01$) and negatively correlated with self-efficacy ($r = -.88$, $p < .01$). Psychological distress was also negatively correlated with self-efficacy ($r = -.84$, $p < .01$). No significant gender differences were found in smartphone addiction, self-efficacy, and psychological distress. Mediation analysis indicated that psychological distress partially mediated the relationship between smartphone addiction and self-efficacy. These findings suggested that increased smartphone use may elevate psychological distress and diminish adolescents self-efficacy. The results highlight the importance of early interventions aimed at managing smartphone use and improving adolescents' mental health and self-efficacy.

Keywords: adolescents, smartphone addiction, psychological distress, self-efficacy

Introduction

The proliferation of smartphones has indelibly reshaped the fabric of modern society, exerting a particularly pronounced influence on the lives of adolescents spanning roughly from the ages of

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12 to 18 (Hurlock, 1980; Arefin *et al.*, 2018). These devices, ubiquitous in contemporary culture, provide unparalleled access to information, enable instantaneous communication, and offer multifaceted avenues for entertainment. However, their pervasive integration has also sparked concern regarding excessive and dysregulated usage, particularly among adolescents, leading to what is commonly referred to as smartphone addiction (Ratan *et al.*, 2022). This form of behavioral addiction, characterized by an uncontrollable urge to use smartphones despite adverse consequences, has been linked to diminished academic performance, impaired social relationships, and increased psychological distress (Arefin *et al.*, 2018). Psychological distress encompasses a spectrum of negative emotional states, including anxiety, depression, stress, and feelings of hopelessness (Runnels, 2008). Alongside these outcomes, self-efficacy—defined as an individual's belief in their capability to perform tasks or achieve goals—plays a pivotal role in adolescent development by influencing motivation, resilience, and psychological well-being (Lee and Bae, 2018).

Given their psychological significance, studies increasingly explore the link between smartphone use and self-efficacy, often including psychological distress; however, gender-based findings remain inconsistent. Some studies suggest that females are more prone to smartphone addiction (Hawi and Samaha, 2016), whereas others report higher prevalence among males (Chiang *et al.*, 2019), and some detect no significant gender disparity (García-Santillán *et al.*, 2021). In terms of self-efficacy, studies alternately show females reporting higher levels (Ibrahim and Wah, 2020), males exhibiting stronger beliefs (Budiarti *et al.*, 2022), or no gender differences at all (Carroll and Fox, 2017). Similar variability exists in findings related to psychological distress, where females are generally reported to experience higher distress levels (Chen *et al.*, 2017; Tangmunkongvorakul *et al.*, 2019), though opposing evidence and null results have also been documented (Buckner, 2011; Silva *et al.*, 2017; Zeng *et al.*, 2019). Given the inconsistent gender-based findings on smartphone addiction, self-efficacy, and psychological distress, this study aims to clarify these relationships and explore potential gender differences.

The correlation between smartphone addiction and self-efficacy is a subject of growing concern within the academic and clinical communities. Research indicated that smartphone addiction was negatively correlated with self-efficacy (Tehrim, 2024). Further complicating this relationship is the role of psychological distress as a mediating factor in the link between smartphone addiction and self-efficacy (Hawi and Samaha, 2016). Adolescents engaging in excessive smartphone use frequently exhibit elevated levels of psychological distress, which may erode their belief in their own abilities (Ding *et al.*, 2022; Sokar, 2024). Moreover, adolescents may turn to smartphones as a maladaptive coping strategy for managing distress, thereby entering a reinforcing cycle of addiction, emotional dysregulation, and diminished self-efficacy (Popescu *et al.*, 2022). The cognitive-behavioral model of addiction posits that such patterns emerge from distorted thinking and ineffective coping mechanisms, where smartphones serve as an escape from negative emotions (Sharp and Tackett, 2014). Complementarily, social cognitive theory emphasizes self-efficacy as a protective factor; adolescents with strong self-beliefs are more resilient and better equipped to manage stress, while those with low self-efficacy may be more susceptible to problematic smartphone use (Yue *et al.*, 2022).

This theoretical framework is further supported by evidence linking smartphone overuse with impaired sleep, reduced cognitive function, and social skill deterioration, all of which contribute indirectly to psychological distress and lower self-efficacy (Extremere *et al.*, 2019). For example, constant alerts, prolonged exposure to digital content, and late-night use can disrupt circadian rhythms, reduce attention span, and inhibit meaningful face-to-face interactions (Chun-mei *et al.*, 2023; Liu and Baharudin, 2025). These cascading effects not only impair daily functioning but also compound emotional and cognitive vulnerabilities in adolescents. Therefore, understanding this complex, reciprocal relationship in culturally specific contexts is critical. In Bangladesh, where societal expectations, academic pressures, and mental health stigma may shape adolescent behavior differently, it is imperative to examine how smartphone addiction, psychological distress, and self-efficacy interact. The conceptual framework of this study is as follows:

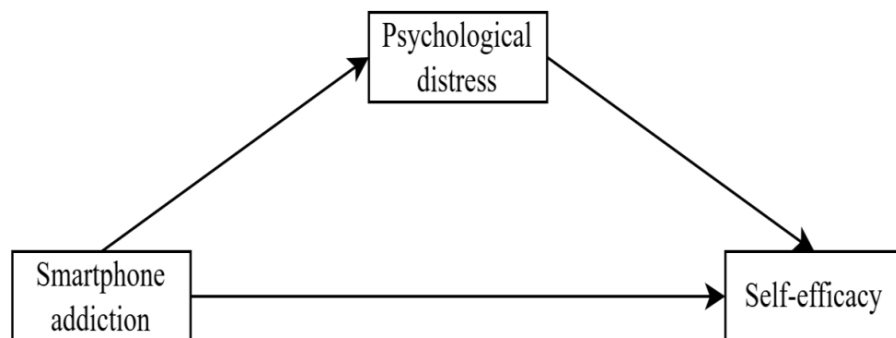


Figure 1. *Conceptual Model*

Objectives

The objectives of the study are as follows:

1. To examine the relationship of smartphone addiction, psychological distress, and self-efficacy among Bangladeshi adolescents.
2. To explore gender differences in smartphone addiction, psychological distress, and self-efficacy among Bangladeshi adolescents.
3. To investigate the mediating role of psychological distress in the relationship between smartphone addiction and self-efficacy.

Materials and Methods

Participants

The study included a total of 320 school going adolescents from Dhaka city of Bangladesh. Among them, 160 were girls and 160 were boys with ages ranging from 13 to 17 years ($M = 15$ years, $SD = 1.41$). Convenience sampling was applied by selecting participants who were readily accessible and willing to take part in the study during the data collection period.

Study design

Cross-sectional survey design was used.

Instruments

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

Smartphone Addiction Scale (SAS)

The Smartphone Addiction Scale (SAS), initially developed by Kwon *et al.* (2013) and later translated into Bangla by Rahaman *et al.* (2015), comprises 33 statements rated on a 6-point Likert scale, where 1 signifies 'strongly disagree' and 6 signifies 'strongly agree'. The cumulative score reflects the intensity of smartphone addiction, with higher totals indicating more severe addiction. The original version demonstrated excellent internal consistency (Cronbach's $\alpha = .97$), while in the present study, the reliability coefficient was found to be .87.

General Self-Efficacy Scale (GSES)

To assess participants' overall sense of personal competence, the Bangla version of the General Self-Efficacy Scale was used. Originally developed by Sherer *et al.* (1982) and adapted into Bangla by Illyas (2005), this instrument includes 17 items rated on a 5-point scale (1 = "disagree strongly" to 5 = "agree strongly"). The scale features 6 positively (1,3,8,9,13,15) worded items and 11 negatively (2,4,5,6,7,10,11,12,14,16,17) worded items, with reverse scoring applied to the latter. The total score, derived by summing all item responses, indicates the individual's level of self-efficacy. In this study, the internal consistency of the scale was acceptable, with a Cronbach's α of .78.

General Health Questionnaire (GHQ-12)

The GHQ-12, developed by Goldberg (1979) and adapted into Bangla by Sorcar and Rahman (1989), is designed to screen for non-psychotic psychiatric issues. It contains 12 items-six positive (e.g., items 1, 3, 4, 7, 8, 12) and six negative (e.g., items 2, 5, 6, 9, 10, 11). Positive items are scored from 0 (strongly agree) to 3 (not at all agree), with negative items reverse scored. Higher scores indicate increased psychological distress. The adapted version has demonstrated good reliability (Cronbach's $\alpha = .81$) and moderate test-retest stability (.57); in this study, the alpha coefficient was .83.

Procedure

Data collection was conducted using self-administered questionnaires, which included demographic questions along with the SAS, GSES, and GHQ-12. Participants were provided with clear instructions and were assured of the confidentiality of their responses. The surveys were completed 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, and frequencies) were calculated to summarize participant characteristics and scale scores. 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 smartphone addiction, psychological distress, and self-efficacy. Additionally, mediation analysis was performed using Hayes' Process Macro 4.2.

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 and Discussion

Before applying inferential statistics, the normality of smart phone addiction, psychological distress, and self-efficacy scores was checked. Regarding the Shapiro-Wilk and Kolmogorov-Smirnov test, p values were above .05 indicating the variables are normally distributed (Goodman, 1954).

Table 1

Correlation Matrix of Smartphone Addiction, Psychological Distress, and Self-Efficacy of Adolescents Students

Variables	1	2	3
1. Smartphone Addiction	-		
2. Psychological Distress	.86**	-	
3. Self-Efficacy	-.88**	-.84**	-

Note. ** $p < .01$

The results indicated a significant positive correlation between smartphone addiction and psychological distress ($r = .86, p < .01$), suggesting that higher smartphone addiction was associated with higher psychological distress. Similarly, psychological distress and self-efficacy was significantly negatively correlated ($r = -.84, p < .01$), indicating that higher psychological distress was associated with lower self-efficacy. On the other hand, smartphone addiction was significantly negatively correlated with self-efficacy ($r = -.88, p < .01$), meaning that individuals with higher smartphone addiction tended to report lower levels of self-efficacy.

Table 2

Gender Differences in Smartphone Addiction, Self-Efficacy, and Psychological Distress Among Adolescents Students

Variables	Girl		Boy		$t (318)$	p
	M	SD	M	SD		
Smartphone Addiction	110.76	33.03	106.33	38.71	-1.10	.273
Self-Efficacy	57.98	11.73	58.17	12.85	-.14	.889
Psychological Distress	20.51	6.22	20.35	6.48	-.23	.814

Note. M = Mean; SD = Standard Deviation.

The results indicated no significant gender differences across these variables. Smartphone addiction scores were slightly higher for girls ($M = 110.76, SD = 33.03$) compared to boys ($M = 106.33, SD = 38.71$), but this difference was not significant, $t (318) = -1.10, p > .05$. Similarly, self-efficacy levels were comparable between girls ($M = 57.98, SD = 11.73$) and boys ($M = 58.17, SD = 12.85$), with no significant difference, $t (318) = -.14, p > .05$. Finally, psychological distress scores were almost identical for girls ($M = 20.51, SD = 6.22$) and boys ($M = 20.35, SD = 6.48$), with no significant difference, $t (318) = -.23, p > .05$.

Table 3*Psychological Distress as a Mediator Between Smartphone Addiction and Self-Efficacy*

Path	<i>B</i>	β	<i>SE</i>	<i>t</i>	<i>p</i>	95% CI	
						<i>UL</i>	<i>LL</i>
a: SPA → PD	.15	.86	.01	29.87	<.001	.16	.14
b: PD → SE	-.60	-.31	.10	-6.32	<.001	-.41	-.79
c (total): SPA → SE	-.30	-.88	.01	-32.99	<.001	-.28	-.32
c' (direct): SPA → SE	-.21	-.61	.02	-12.49	<.001	-.18	-.24
a*b (indirect): SPA → PD → SE	-.09	-.27	.02	-	-	-.06	-.12

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

The mediation analysis results, as shown in Table 2, indicated significant relationships between the variables. Specifically, there was a significant positive effect of smartphone addiction (SPA) on psychological distress (PD) (path a; $B = .15$, $p < .001$), and a significant negative effect of psychological distress on self-efficacy (SE) (path b; $B = -.60$, $p < .001$). Furthermore, the indirect effect of SPA on SE through PD was significant ($B = -.09$, 95% CI $[-.12, -.06]$). The direct effect of SPA on SE remained significant but was smaller ($B = -.21$, $p < .001$) compared to the total effect ($B = -.30$, $p < .001$). These findings suggest that psychological distress partially mediates the relationship between smartphone addiction and self-efficacy.

The study set out to examine the triadic association of smartphone addiction, psychological distress, and self-efficacy in adolescents. The first objective was to assess association among smartphone addiction, self-efficacy, and psychological distress. The strong positive correlation between smartphone addiction and psychological distress suggested that as adolescents become more dependent on their smartphones, they are likely to experience heightened levels of anxiety, depression, and overall psychological discomfort. This finding is consistent with existing research that posits a link between smartphone addiction and various mental health issues (Popescu *et al.*, 2022). Conversely, the significant negative correlation between smartphone addiction and self-efficacy implies that heightened engagement with smartphones, potentially to the point of addiction, is associated with a diminished sense self-efficacy in adolescents. This result is similar with previous finding that excessive smartphone use displaces opportunities for real-world accomplishments and social interactions that bolster self-efficacy (Ge *et al.*, 2023). Furthermore, the inverse relationship between psychological distress and self-efficacy supported by prior evidence that underscores the protective role of self-efficacy in mental health, as adolescents with a stronger belief in their abilities appear to be more resilient to the negative impacts of psychological distress (Yue *et al.*, 2022).

The second objective was to investigate the gender differences in smartphone addiction, self-efficacy, and psychological distress among adolescent's student. Findings revealed no significant gender differences in smartphone addiction, self-efficacy, and psychological distress among adolescent students. This result aligns with previous studies that suggested widespread integration of smartphones into academic and social life, where both genders rely heavily on these devices

for communication, information access, and entertainment (Hawi and Samaha, 2016). Moreover, the non-significant gender difference in psychological distress levels pattern mirrors prior research which found that both male and female students experience similar stressors related to academic demands, social pressures, and financial concerns (Tangmunkongvorakul *et al.*, 2019). The absence of significant differences in self-efficacy between male and female students confirms prior evidence suggesting that rigorous academic environment inherent to academic life; this environment necessitates that individuals of all genders cultivate a strong belief in their capabilities to meet the demands of their coursework, social interactions, and future career prospects, thus fostering a relatively uniform sense of competence across genders within this specific context (Thomas and Segal, 2006).

The third objective was to examine the mediating role of psychological distress between smartphone addiction and self-efficacy of adolescent in Bangladesh. Finding revealed a significant mediating role of psychological distress in the association between smartphone addiction and self-efficacy, aligning with previous research demonstrating the interconnectedness of these constructs (Sokar, 2024). The findings indicated a positive effect of smartphone addiction on psychological distress. This result aligns with previous research that has consistently highlighted that increased reliance on smartphones is associated with heightened feelings of anxiety, depression, and overall psychological discomfort (Eichenberg *et al.*, 2021). This suggests that the compulsive nature of smartphone use and the constant stimulation it provides may overwhelm individuals' coping mechanisms, leading to increased psychological distress (Cho *et al.*, 2017). Conversely, psychological distress demonstrated a significant negative influence on self-efficacy, which is in line with the well-documented inverse relationship explained that experiencing heightened levels of psychological distress diminishes an individual's belief in their ability to effectively manage challenges and achieve desired outcomes (Buckner, 2011). The detrimental effect of psychological distress on self-efficacy can be understood through the lens of impaired cognitive resources, where heightened anxiety and negative emotions consume attentional capacity and hinder effective problem-solving abilities (Ward *et al.*, 2017). Furthermore, the indirect effect of smartphone addiction on self-efficacy, mediated by psychological distress, was found to be significant, suggesting that the detrimental impact of smartphone addiction on self-efficacy is partially exerted through the exacerbation of psychological distress. Prior research has demonstrated that psychological distress partially mediates the relationship between smartphone addiction and reduced self-efficacy, indicating that increased distress may help explain how smartphone overuse negatively impacts individuals' confidence in their abilities (Horwood and Anglim, 2019).

The persistence of a significant direct effect of smartphone addiction on self-efficacy, even after accounting for psychological distress, suggests that distress only partially mediates this relationship. Previous findings suggested that, although distress plays a significant role, additional unexplored mechanisms also contribute to the negative effects of smart phone addiction on self-efficacy (Liu *et al.*, 2019). This is supported by previous research that factors such as reduced face-to-face interactions, diminished physical activity, or exposure to unrealistic social comparisons on social media platforms also independently contribute to the erosion of self-efficacy among individuals with smart phone addiction (Velthoven *et al.*, 2018).

Conclusion

This study examined links between smartphone addiction, psychological distress, and self-efficacy among Bangladeshi adolescents. Findings showed that higher smartphone addiction is associated with increased distress and reduced self-efficacy, with distress partially mediating this relationship. No gender differences were found. The results highlight the importance of early interventions to reduce smartphone overuse and support adolescent mental health and self-efficacy.

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