Asian Journal of Arts and Social Sciences
Volume: I, Issue: II, pp. 08-15, April 2026
E-ISSN: 0000-0000
Available online at: www.academypg.org

Original Research

Exploring the Relationship between Mobile Phone Use, Academic Performance, and Mental Health among Adolescents

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Received: 08/November/ 2025. **Revised**: 23/March/2026. **Accepted**: 01/April/2026. **Published**: 26April/2026.

Abstract

Background
Mobile phone use has become an important part of adolescents' daily lives, especially for communication, education, entertainment, and social interaction. However, excessive and uncontrolled use of mobile phones may create negative consequences for young people, particularly in relation to academic performance and mental well-being. In Bangladesh, adolescents are increasingly exposed to mobile phones at an early age, making this issue an important area of social and public health concern.

Highlights/Key Point of Article
- Mobile phone use was very common among adolescents, with most using phones daily.
- Longer phone use was significantly linked with poorer academic performance.
- Excessive phone use was also significantly associated with increased depression and mental pressure.

Objective
This study examined the association between mobile phone use, academic performance, and mental health among adolescents in Bangladesh.

Methods
A cross-sectional quantitative study was conducted among 165 adolescents from Dhaka, Rangpur, and Savar to examine the relationship between mobile phone use, academic performance, and mental health. Data were collected through a structured questionnaire containing questions on socio-demographic characteristics, patterns of mobile phone use, study habits, academic outcomes, and selected mental health-related indicators. The respondents were selected from the study areas using a suitable sampling approach. After data collection, the responses were checked, coded, and entered for analysis. Descriptive statistics, including frequency and percentage distributions, were used to summarize the characteristics of the respondents. Chi-square tests were applied to examine the association between mobile phone use and key study variables, including academic performance and mental health status. A significance level of 5% was considered for statistical interpretation.

Results
The findings show that mobile phone use was highly common among the respondents, and 75.2% of the adolescents had their own mobile phone. Daily mobile phone use was significantly associated with academic performance ($\chi^2 = 12.45$, $p = .014$), indicating that patterns of phone use may influence students' educational outcomes. The study also found a significant association between daily mobile phone use and increased depression ($\chi^2 = 18.72$, $p = .001$). In addition, many respondents reported mental pressure, social isolation, addictive behavior, sleep disturbance, and other health-related concerns linked to excessive mobile phone use.

Conclusion
The study concludes that excessive mobile phone use may negatively affect both academic performance and mental health among adolescents. These findings highlight the need for parental guidance, school-based awareness programs, and responsible digital habits. Promoting balanced mobile phone use may help adolescents benefit from digital technology while reducing its harmful effects on their education and psychological well-being.

Keywords— Mobile phone use; Adolescents; Academic performance; Mental health; Depression; Digital well-being; Bangladesh

1. Introduction

Mobile phones have become an essential part of daily life and communication in the modern digital era. Adolescents are among the most active users of mobile phones because of their increasing engagement with social networking platforms, online learning, gaming, and digital communication. Although mobile phones provide several benefits, including access to educational resources, social connectivity, and instant communication, excessive use among adolescents has raised growing concerns regarding its potential effects on academic performance, mental health, and social behavior (Kuss & Griffiths, 2017).

Adolescence is a critical developmental stage characterized by emotional, psychological, and social changes. During this period, excessive dependence on mobile phones may negatively influence concentration, sleep patterns, interpersonal relationships, and emotional well-being. Previous studies have reported that prolonged mobile phone use is associated with increased stress, anxiety, depression, social isolation, and addictive behaviors among adolescents (Elhai et al., 2017). Furthermore, excessive screen time may reduce academic concentration and learning efficiency, resulting in poor academic achievement and decreased classroom engagement (Lepp et al., 2015).

Several researchers have also identified a relationship between mobile phone addiction and mental health problems among adolescents. Excessive smartphone use can increase feelings of loneliness, emotional instability, and depressive symptoms due to social comparison, cyberbullying, and reduced face-to-face interactions (Twenge & Campbell, 2018). Moreover, long hours of mobile phone use may contribute to sleep disturbances and fatigue, which can further affect adolescents' psychological and academic functioning.

Despite the increasing use of mobile phones among adolescents in developing countries, limited studies have explored the combined effects of mobile phone use on academic performance and mental health among Bangladeshi adolescents. Understanding these associations is important for developing awareness programs and promoting healthy digital habits among young people. Therefore, the present study aimed to examine the patterns of mobile phone use and its association with academic performance and mental health outcomes among adolescents. The study also explored the relationship between daily mobile phone usage duration and increased depression among the respondents.

2. Related Work

Previous studies have shown that mobile phone use among adolescents is increasing rapidly and has become closely connected with education, communication, entertainment, and social interaction. While mobile phones support learning and social connectivity, excessive or uncontrolled use has been linked with several negative outcomes, particularly in relation to academic performance, mental health, sleep quality, and social behavior.

Kuss and Griffiths (2017) reported that problematic use of digital and social networking platforms may create addictive behavioral patterns, especially among young users. Similarly, Elhai et al. (2017) found that problematic smartphone use is associated with anxiety and depressive symptoms. These findings suggest that adolescents who spend long hours using mobile phones may become more vulnerable to emotional distress, isolation, and reduced psychological well-being.

Academic performance is another important area affected by mobile phone use. Lepp et al. (2015) found a negative relationship between excessive cell phone use and academic performance, indicating that frequent phone use may reduce students' attention, study time, and classroom engagement. This is consistent with the present study, where daily mobile phone use duration was significantly associated with academic performance among adolescents.

Research has also highlighted the relationship between screen time and mental health. Twenge and Campbell (2018) observed that higher screen time was associated with lower

psychological well-being among children and adolescents. Excessive mobile phone use may contribute to sleep disturbance, stress, loneliness, and depressive feelings. In the present study, increased depression was significantly associated with daily mobile phone use duration, supporting previous findings that prolonged digital exposure may negatively affect adolescents' mental health.

Existing literature indicates that although mobile phones provide educational and social benefits, excessive use may create academic and psychological risks for adolescents. Therefore, further research is important to understand mobile phone use patterns and their effects in different socio-cultural contexts, particularly among adolescents in Bangladesh.

3. Objective

General Objective

To examine the patterns of mobile phone use and its effects on academic performance and mental health among adolescents.

Specific Objectives

1. To identify the patterns and duration of mobile phone use among adolescents.
2. To assess the perceived effects of mobile phone use on adolescents' academic performance.
3. To evaluate the association between daily mobile phone usage duration and depression among adolescents.
4. To explore the psychological and social effects of excessive mobile phone use, including mental pressure, addiction, and social isolation.
5. To examine the relationship between mobile phone use duration and academic performance among adolescents.

4. Methodology

Study Design

This study employed a cross-sectional quantitative research design to investigate mobile phone use patterns and their effects on academic performance and mental health among adolescents.

Study Area and Population

The study was conducted among adolescents from three areas of Bangladesh: Dhaka, Rangpur, and Savar. The target population included adolescent mobile phone users from different socio-economic backgrounds.

Sample Size and Sampling Technique

A total of 165 respondents participated in the study. Participants were selected using a convenience sampling technique based on their availability and willingness to participate in the survey.

Data Collection Procedure

Data were collected through a structured questionnaire designed to gather information on socio-demographic characteristics, mobile phone usage patterns, academic performance, and psychological effects related to mobile phone use. The questionnaire included both closed-ended and multiple-choice questions. Data collection was conducted directly from the respondents after obtaining informed consent.

Study Variables

The independent variable of the study was daily mobile phone use duration. Dependent variables included academic performance, increased depression, mental pressure, addiction, and perceived risks associated with mobile phone use.

Data Analysis

The collected data were coded, entered, and analyzed using statistical software. Descriptive statistics such as frequency and percentage were used to summarize socio-demographic characteristics and mobile phone usage patterns. Chi-square (χ^2) tests were performed to examine the association between daily mobile phone use duration, academic performance, and increased depression among adolescents. A p-value of less than 0.05 was considered statistically significant.

Ethical Considerations

Participation in the study was voluntary, and respondents were informed about the purpose of the research before data collection. Confidentiality and anonymity of the participants were maintained throughout the study, and the collected information was used solely for academic research purposes.

5. Data Analysis

Table 1: Socio-demographic Characteristics of Respondents (N = 165)

Variable	Category	N (%)
Gender	Female	67 (40.6%)
	Male	98 (59.4%)
Area	Dhaka	50 (30.3%)
	Rangpur	50 (30.3%)
	Savar	65 (39.4%)
Family members	2–3	11 (6.7%)
	4–5	82 (49.7%)
	More than 5	72 (43.6%)
Living type	With parents	146 (88.5%)
	With relatives	19 (11.5%)
Family monthly income	Below 10,000	44 (26.7%)
	10,000–20,000	36 (21.8%)
	20,001–30,000	27 (16.4%)
	30,001–40,000	18 (10.9%)
	Above 40,000	40 (24.2%)

Table 1 presents the socio-demographic profile of the 165 adolescent respondents included in the study. Among them, the majority were male, 98 (59.4%), while 67 (40.6%) were female. Regarding residential area, the largest proportion of respondents came from Savar, 65 (39.4%), followed by Dhaka and Rangpur, each representing 50 (30.3%) respondents. In terms of family size, nearly half of the respondents, 82 (49.7%), lived in families with 4–5 members, while 72 (43.6%) belonged to families with more than five members. Only 11 (6.7%) respondents reported having 2–3 family members. Most adolescents, 146 (88.5%), lived with their parents, whereas 19 (11.5%) lived with relatives. Monthly family income varied among the respondents. The highest proportion, 44 (26.7%), reported a monthly family income below BDT 10,000, followed by 40 (24.2%) respondents from families earning above BDT 40,000. Additionally, 36 (21.8%) respondents had a family income of BDT 10,000–20,000, 27 (16.4%) reported BDT 20,001–30,000, and 18 (10.9%) reported BDT 30,001–40,000. Overall, the sample represented adolescents from diverse socio-economic and residential backgrounds.

Table 02: Mobile Phone Use Pattern among Adolescents (N = 165)

Variable	Category	N (%)
Using mobile phone	Yes	159 (96.4%)
	No	6 (3.6%)
Having own phone	Yes	124 (75.2%)
	No	41 (24.8%)
Using period in years	1–3 years	106 (64.2%)
	4–6 years	51 (30.9%)
	More than 7 years	8 (4.8%)
Spending hours daily	1–3 hours	114 (69.1%)
	4–6 hours	40 (24.2%)
	7 hours or more	11 (6.7%)
Mobile phone expense provider	Parents	116 (70.3%)
	Self	49 (29.7%)
Mobile using space	In front of everyone	132 (80.0%)
	Secretly	33 (20.0%)

Table 2 shows that mobile phone use was highly common among the respondents. Most adolescents, 159 (96.4%), reported using a mobile phone, while only 6 (3.6%) did not. A large proportion, 124 (75.2%), had their own mobile phone. Regarding duration of use, most respondents, 106 (64.2%), had been using mobile phones for 1–3 years, followed by 51 (30.9%) for 4–6 years. Daily use was mostly within 1–3 hours, reported by 114 (69.1%) respondents, while 40 (24.2%) used mobile phones

for 4–6 hours and 11 (6.7%) used them for 7 hours or more. Most mobile phone expenses were provided by parents, 116 (70.3%), whereas 49 (29.7%) paid for themselves. In terms of usage space, 132 (80.0%) respondents used mobile phones openly in front of others, while 33 (20.0%) reported using them secretly. Overall, the findings indicate widespread mobile phone access and regular use among adolescents.

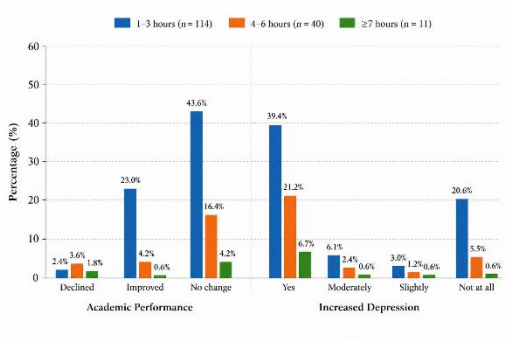

Figure 01: Association of daily mobile phone use duration with academic performance and increased depression among adolescents

Figure 1 shows the percentage distribution of adolescents' academic performance and depression status according to daily mobile phone use duration. Most adolescents using mobile phones for 1–3 hours per day reported no change in academic performance (43.6%), while 23.0% reported improvement and 2.4% reported decline. Among those using phones for 4–6 hours, 16.4% reported no change, 4.2% reported improvement, and 3.6% reported decline. For adolescents using phones for ≥7 hours, academic improvement was very low (0.6%), while 1.8% reported declined performance. For depression, 39.4% of adolescents using phones for 1–3 hours reported increased depression, followed by 21.2% among those using phones for 4–6 hours and 6.7% among those using phones for ≥7 hours. The figure indicates that daily mobile phone use duration was significantly associated with both academic performance and increased depression among adolescents.

Table 3: Reported Effects of Mobile Phone Use among Adolescents (N = 165)

Variable	Category	%
Mental pressure due to phone use	Increased	111 (33.6%)
	Felt isolated	95 (28.8%)
	Felt addicted	66 (20.0%)
	Mental pressure decreased	58 (17.6%)
Major risk of mobile phone use	Health issues	66 (40.0%)
	Academic decline	53 (32.1%)
	Family conflict	21 (12.7%)
	Cyberbullying	14 (8.5%)
	Sleep problems	11 (6.7%)
Academic performance	No change	106 (64.2%)
	Improved	46 (27.9%)
	Declined	13 (7.9%)
Low performance caused by mobile phone	Yes	78 (47.3%)
	Sometimes	32 (19.4%)
	Mostly	39 (23.6%)
	Not at all	16 (9.7%)
Depression increased by mobile phone	Yes	111 (67.3%)
	Slightly	8 (4.8%)
	Moderately	15 (9.1%)
	Quite a lot	18 (10.9%)
	Not at all	13 (7.9%)

Table 3 presents the perceived effects of mobile phone use among adolescents. Regarding mental pressure, 111 (33.6%) respondents reported increased mental pressure, while 95 (28.8%) felt isolated and 66 (20.0%) felt addicted. However, 58 (17.6%) respondents reported decreased mental pressure. The major reported risks of mobile phone use were health issues, 66 (40.0%), and academic decline, 53 (32.1%). Other risks included family conflict, 21 (12.7%), cyberbullying, 14 (8.5%), and sleep problems, 11 (6.7%). In terms of academic performance, most respondents, 106 (64.2%), reported no change, while 46 (27.9%) reported improvement and 13 (7.9%) reported decline. However, 78 (47.3%) respondents stated that mobile phone use caused low academic performance, and 39 (23.6%) reported that it mostly affected their

performance. Depression was also commonly reported, with 111 (67.3%) respondents stating that mobile phone use increased depression. Additionally, 18 (10.9%) reported quite a lot of increase, 15 (9.1%) reported moderate increase, and 8 (4.8%) reported slight increase. Only 13 (7.9%) reported no increase in depression. Overall, the findings suggest that mobile phone use among adolescents was associated with mental pressure, perceived health risks, academic concerns, and increased depressive feelings.

Table 04: Association Between Daily Mobile Phone Use Duration, Academic Performance, and Increased Depression Among Adolescents

Outcome variable	**Response category**	Usage Duration n (%)			χ^2	***p***
		1–3 hours	**4–6 hours**	**≥7 hours**		
Academic performance	Declined	4 (2.4)	6 (3.6)	3 (1.8)	12.45	.014*
	Improved	38 (23.0)	7 (4.2)	1 (0.6)		
	No change	72 (43.6)	27 (16.4)	7 (4.2)		
Increased depression	Yes	65 (39.4)	35 (21.2)	11 (6.7)	18.72	.001**
	Moderately	10 (6.1)	4 (2.4)	1 (0.6)		
	Slightly	5 (3.0)	2 (1.2)	1 (0.6)		
	Not at all	34 (20.6)	9 (5.5)	1 (0.6)		

Table 4 illustrates the association between daily mobile phone use duration, academic performance, and increased depression among adolescents. A statistically significant association was observed between daily mobile phone use duration and academic performance ($\chi^2 = 12.45$, $p = .014$). Among respondents who used mobile phones for 1–3 hours daily, 72 (43.6%) reported no change in academic performance, while 38 (23.0%) reported improvement and only 4 (2.4%) reported decline. In contrast, among adolescents using mobile phones for 4–6 hours and ≥7 hours daily, the proportion reporting declined academic performance was comparatively higher, suggesting that prolonged mobile phone use may negatively influence academic outcomes. A significant association was also found between daily mobile phone use duration and increased depression ($\chi^2 = 18.72$, $p = .001$). Among respondents using mobile phones for 1–3 hours daily, 65 (39.4%) reported increased depression, whereas higher proportions of depression were observed among those using mobile phones for 4–6 hours and ≥7 hours daily. Adolescents with longer daily usage durations also reported moderate and slight levels of depression more frequently compared to lower-duration users. Conversely, respondents reporting no depressive effects were more common among those with shorter daily mobile phone use duration. The findings indicate that extended daily mobile phone use was significantly associated with poorer academic performance and higher levels of depression among adolescents.

6. Results and Discussion

The present study explored the patterns of mobile phone use and their effects on academic performance and mental health among adolescents. The findings revealed that mobile phone use was highly prevalent among the respondents, with most adolescents owning personal mobile phones and using them regularly for several hours each day. These findings reflect the growing dependence on mobile phones among adolescents, which has also been reported in previous studies (Kuss & Griffiths, 2017).

The study found that prolonged daily mobile phone use was significantly associated with academic performance. Adolescents who used mobile phones for longer durations were more likely to report declining academic performance compared to those with shorter usage durations. This finding is consistent with the study conducted by Lepp et al.

(2015), which reported that excessive mobile phone use negatively affects students' concentration, classroom engagement, and study time, ultimately reducing academic achievement. Excessive engagement with mobile phones may distract adolescents from academic activities and reduce their ability to maintain attention during learning processes.

The findings also demonstrated a significant association between daily mobile phone use duration and increased depression among adolescents. Respondents with longer mobile phone usage duration reported higher levels of depressive feelings and mental pressure. This result supports the findings of Elhai et al. (2017), who reported that problematic smartphone use is strongly associated with anxiety and depression. Similarly, Twenge and Campbell (2018) found that excessive screen time negatively affects psychological well-being among adolescents. Prolonged exposure to digital platforms, reduced physical interaction, sleep disturbance, and social comparison through social media may contribute to emotional distress and depressive symptoms.

In addition, many respondents in the present study reported feelings of isolation, addiction, and mental pressure related to mobile phone use. These findings align with the observations of Kuss and Griffiths (2017), who emphasized that excessive engagement with digital and social networking platforms can lead to addictive behavioral patterns and social disconnection among young individuals.

The study further identified health issues and academic decline as major perceived risks associated with mobile phone use. Excessive screen exposure and prolonged phone usage may contribute to physical and psychological health problems, including eye strain, sleep disturbance, stress, and reduced social interaction. These findings suggest that uncontrolled mobile phone use may have multidimensional effects on adolescents' well-being.

The findings of this study are consistent with previous literature indicating that excessive mobile phone use among adolescents is associated with negative academic and psychological outcomes. The study highlights the importance of promoting healthy mobile phone usage habits, parental supervision, and awareness programs to reduce the harmful effects of excessive mobile phone use among adolescents in Bangladesh.

7. Conclusion and Future Scope

This study concludes that mobile phone use is highly common among adolescents and is significantly associated with academic performance and mental health outcomes. Prolonged daily use was linked with poorer academic performance, increased depression, mental pressure, isolation, addiction, and health-related concerns. Although mobile phones support communication and learning, uncontrolled use may negatively affect adolescents' concentration, emotional well-being, and educational achievement. Therefore, parents, teachers, and policymakers should promote responsible mobile phone use through awareness, guidance, and digital well-being practices. Future research should include larger and more diverse samples, examine long-term effects, and explore related factors such as sleep quality, cyberbullying, social media addiction, family relationships, and effective intervention strategies.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request. To protect participants' privacy and confidentiality, the dataset is not publicly shared.

Conflict 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 study.

Funding Source

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. The study was entirely self-funded by the authors.

Authors' Contribution

Tanvir Hasan Rafi conceptualized and designed the study, supervised the research process, and contributed to manuscript revision. Nusrat Jahan conducted the data collection and assisted in data analysis and interpretation. Ariful Bari contributed to the literature review, statistical analysis, and drafting of the manuscript. All authors reviewed, revised, and approved the final version of the manuscript for publication.

Acknowledgements

The authors sincerely thank all adolescent participants for sharing their valuable responses. The authors also appreciate the support of parents, teachers, community members, and colleagues who assisted during data collection and provided guidance throughout the study.

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