

## **Prevalence and Triggering Factors Associated with Mobile Phone Addiction among University Students in Bangladesh**

**Antora Ghosh<sup>1</sup>, Sabiha Shirin Sara<sup>2</sup>, Chuton Deb Nath<sup>3</sup>, Ashis Talukder<sup>4</sup>**

<sup>1,2</sup>Statistics Discipline, Science Engineering and Technology School, Khulna University, Khulna-9208, Bangladesh

<sup>3</sup>Assistant Professor, Mass Communication and Journalism Discipline, Khulna University, Khulna-9208, Bangladesh

<sup>4</sup>Assistant Professor, Statistics Discipline, Science Engineering and Technology School, Khulna University, Khulna-9208, Bangladesh.

### **ABSTRACT**

**BACKGROUND:** Nowadays, mobile phones are constantly being improved by enlarging upon their functionalities, which in turn increases the tendency of overuse and addiction. This study aimed to find the prevalence and factors associated with mobile phone addiction (MPA) among university students in Bangladesh.

**METHODS:** This study recruited 379 participants by a self-administrated online based e-questionnaire using a cross section design. Leung's Mobile phone Addiction Index Scale was used to assess MPA. In addition, logistic regression analysis was used to explore the associated factors for MPA.

**RESULTS:** The overall prevalence of MPA was 42.2 % among the current university students. However, the addiction rate was 45.7 % among <25 years old participants. Spending time on the social media sites and lose sleep due to late night internet device activity were the reasons for MPA among university students in Bangladesh. Participants age less than 25 years and studying in undergraduate level had a higher chance of MPA.

**CONCLUSION:** This study exposed that the prevalence of MPA was comparatively higher among younger participants. Spend time on social media sites and lose sleep due to late night internet activity are the most significant determinants of MPA. Thus, raising awareness among the younger generation is most important to reduce MPA. The findings of the study can be used to support health and educational organizations design programs that will help prevent MPA among university students in Bangladesh.

**KEYWORDS:** Mobile phone addiction; University students; Factors; Bangladesh.

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### **INTRODUCTION**

Mobile phone is one of the most popular technologies in this present era. As mobile phone can make complicated things easier and more convenient, it's very popular to the people of all ages. (Toppr Guide, 2019). But the compulsive uses of mobile phone can interfere with work, study and relationships. Excessive use of social media, repeatedly checking texts, emails or apps, and playing games can have negative consequences in daily life, it can be referred as mobile phone addiction (MPV), which can also be called as problematic mobile phone use. (Lawrence Robinson et al,2021).

According to the information of Addiction Center, there are over 3.8 billion mobile phone users in the world, among them, 6.3% have a phone addiction (Suzette Gomez, 21). The primary cause of mobile addiction is dopamine which is a neurotransmitter. Many studies have shown that the mobile phone activity causes the release of dopamine in our brains, making us feel good, motivated, and happy (Team Lemonade). That's motivate us to use mobile phone more. However, mobile phone addiction can lead to severe impairment or distress in one's life (PsychGuides.com, 2015). Studies prove that, adolescents who are addicted to their mobile phone are more likely to experience chronic stress and low emotional stability (Verizon). Moreover, excessive use

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of mobile phone can result in a number of different physical problems that may cause permanent loss or be difficult to treat, including digital eye strain, neck problems, car accidents and male infertility etc (PsychGuides.com, 2013). A Korean study confirmed that abnormal users of mobile phone's had notably more problematic behaviors, somatic symptoms, attention deficits and aggression, and greater intense psychopathologies (Deborah Brauser, 2013). Problematic mobile phone usage may cause mental health problems such as depression, anxiety (Lawrence Robinson et al, 2021), "Nomophobia" (Ali Haydar et al., 2012) and reduce personal well-being, life satisfaction (Volkmer et al., 2019). Mobile phone use can also impact on peer relations and family relations (Raymond Chui, 2015).

In Bangladesh, at the end of November 2021, total number of Mobile Phone subscribers has reached 181.53 million in Bangladesh (BTRC). The "daily sun" reported that, there were 379120000 Facebook users in Bangladesh in March 2020, which accounted for 21.9% of the whole population. The majority of the people were men (71.6%). People aged 18 to 24 were the biggest user group of social media (Rakib, 2021). Although there were several studies conducted on mobile phone addiction in Bangladesh but maximum studies were trying to measure the impact of mobile phone addiction on academic performance of students. Moreover, the biggest challenges to work in this area are diversity of terms, criteria, and constructs available in the field (De-Sola Gutiérrez et al., 2016). Globally, different self-reported questionnaires have been developed to determine the mobile phone addiction. Many studies on "problematic mobile phone use" have used mobile phone addiction questionnaire (Leung, 2008; Martinotti et al., 2011; Parashkouh, Mirhadian, Emamigaroudi, Hasandoost, & Rafiei, 2016) (Sahu et al., 2019).

Hence, this cross-sectional web-based study aimed to estimate the prevalence of mobile phone addiction and identify the factor associated with mobile phone addiction among university students in Bangladesh.

### METHODS

#### Study design and participants

This study was a web based cross-sectional study in nature, and the data was collected online for around four months, started from 14 January 2022 and ended on 16 May 2022. The participants were recruited through their existing Facebook and Gmail account. They were invited to respond to a self-administrated e-questionnaire developed using Google Form. The e-questionnaire contained two separate but interrelated modules, including questions on socio demographic information and behavioral issues as well as mobile phone addiction measurement. This study encouraged the participants to answer intelligently through the e-questionnaire descriptions to confirm the survey quality. A

total of 379 responses were recorded and the response rate was 97%.

#### Mobile phone addiction test

MPA of the participants was measured by Leung's mobile phone addiction index scale (Leung, 2008). The MPAAI – the most commonly and frequently used scale measuring the mobile phone addiction of young people – comprises of 17 items on 5-point Likert scale ranging from 'not at all (1) to always (5) with a maximum score 85. Mobile phone addiction is sometimes referred to as mobile phone dependence. WHO considers addiction as dependence, defined as the continual use of something for the purpose of relief or stimulation, which frequently produces cravings when it is not present (WHO, 2014). Based on the scoring, the participants would be classified into 'mobile phone dependent' (>51) and 'non-MPD' (<51) (Wang et al., 2016). In previous studies, this scale demonstrated good reliability and validity (Leung, 2008; Lian et al., 2016). In practice, the  $\alpha$  coefficient of this scale was 0.88.

#### Socio-demographic and behavioral characteristics

In this study, a group of factor was considered explanatory variables based on previous research, to measure their effect on MPA. Socio-demographic information concerning gender, age, level of education, family income was collected (Kriti Thapa et al., 2020). Furthermore, for basic behavioral factors, the present study asked a few questions related to lifestyle. As for mobile bill, participants were asked to report their monthly mobile bill as high or low (Kriti Thapa et al., 2020). They were asked about how long they spent on social media sites, duration of phone calls per day (Kriti Thapa et al., 2020). They were also asked about their mostly used social media sites, purpose of using mobile phone, internet connection type and sleep status due to late night internet activity.

#### STATISTICAL ANALYSIS

Statistical package for social science (SPSS) was used for analyzing the collected data. Data analysis was divided into three parts- univariate analysis, bivariate analysis, and multivariable analysis. Univariate analysis contains frequency distribution table, and bivariate analysis contains chi-square test. As a multivariable analysis, logistic regression model was used to find the association of several risk factors with MPV simultaneously. More specifically, binary logistic regression analysis was conducted as our dependent variable had a binary outcome which can be coded as 0 and 1. Now, if we define  $p$  as the probability that the outcome is 1, then we can write the binary logistic regression models for  $k$  predictors is as follows:

$$\hat{P} = \frac{\exp(b_0 + b_1X_1 + b_2X_2 + \dots + b_pX_p)}{1 + \exp(b_0 + b_1X_1 + b_2X_2 + \dots + b_pX_p)}$$

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The parameter of the model can be estimated using the maximum likelihood method and the form will be as follows:

$$\ln\left(\frac{p}{(1-p)}\right) = b_0 + b_1X_1 + b_2X_2 + \dots + b_pX_p$$

The coefficients produced from the model (e.g.,  $b_1$ ) represent the change in the expected log odds compared to a one unit change in  $X_1$  while all other predictors remain constant in logistic regression (Logistic Regression Analysis, 2016).

## RESULTS

Background profile information of the study population is essential to interpret the findings of the study and to examine any cause-effect relationship among the study variables. **Table 4.1** shows that how much data comes from different categories of the explanatory variables and dependent variable.

**Table 4.1** Frequency distribution table for different variables

Variable	Frequency	Percent
<b>Age</b>		
>25 years	61	16.1
<25 years	318	83.9
<b>Gender</b>		
Male	219	57.8
Female	160	42.2
<b>Education level</b>		
Undergraduate	288	76.0
Postgraduate	91	24.0
<b>Family income (Monthly)</b>		
10000-20000 Tk	138	36.4
20000-30000 Tk	76	20.1
Above 30000 Tk	162	42.7
<b>Purpose of using Mobile Phone</b>		
Business	4	1.1
Study	10	2.6
Communication and Entertainment	14	3.7
Communication and Study	19	5.0
Study, Communication and entertainment	330	87.1
<b>Type of internet connection</b>		
Wi-Fi	269	71.0
Mobile data	109	28.8
<b>Monthly mobile bill</b>		
100-200 Tk	170	44.9
200-300 Tk	93	24.5
Above 300 Tk	114	30.1
<b>Most used social media sites</b>		
Youtube	69	18.2
Facebook	127	33.5
Whatsapp	11	2.9
All	172	45.4
<b>Time spend on social media sites</b>		
1 hour	27	7.1
1 hour-2 hours	104	27.4
3-4 hours	119	31.4
Above 4 hours	129	34.0
<b>Time spend on mobile phone (calls only)</b>		
Less than 30 min	206	54.4
30 min-1 hour	80	21.1
1 hour-2 hours	93	24.5
<b>Lose sleep due to late night internet activity at least once a week</b>		

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Yes	182	48.0
No	197	52.0
<b>Mobile Phone Dependency</b>		
Mobile Phone Dependent	160	42.2
Non-MPD	210	55.4

**Table 4.2** shows the association between mobile phone dependence (mobile phone dependent Vs. non-MPD) with its related covariates.

**Table 4.2 Distribution of mobile phone dependence (Mobile phone dependence Vs. non-MPD)**

Variables	n (%)	Mobile phone Dependence		Chi-Square	P Value
		Mobile Phone Dependent (>51 scores)n (%)	Non-MPD (<51score)n (%)		
<b>Overall</b>	370	160 (42.2)	210 (55.4)		
<b>Age</b>					
<25 years	311 (84.1)	142 (45.7)	169 (54.3)	4.638	<b>0.031</b>
>25 years	59 (15.9)	18 (30.5)	41 (69.5)		
<b>Gender</b>					
Male	214 (57.8)	94 (43.9)	120 (56.1)	0.096	0.756
Female	156 (42.2)	66 (42.3)	90 (57.7)		
<b>Education level</b>					
Undergraduate	280 (75.7)	119 (42.5)	161 (57.5)	0.259	0.611
Postgraduate	90 (24.3)	41 (45.6)	49 (54.4)		
<b>Family income (Monthly)</b>					
10000-20000 Tk	136 (37.1)	49 (36.0)	87 (64.0)		
20000-30000 Tk	78 (21.3)	33 (42.3)	45 (57.7)	6.612	<b>0.037</b>
Above 30000 Tk	153 (41.7)	78 (51.0)	49 (49.0)		
<b>Purpose of using Mobile Phone</b>					
Business	4 (1.1)	0 (0.0)	4(1.9)		
Study	10 (2.7)	4 (40.0)	6 (60.0)		
Communication and Entertainment	13 (3.5)	8 (61.5)	5 (38.5)	5.189	0.268
Communication and Study	19 (5.2)	7 (36.8)	12 (63.2)		
Study, Communication and entertainment	322 (87.5)	140 (43.5)	182 (56.5)		
<b>Type of internet connection</b>					
Wi-Fi	265 (71.8)	110 (41.5)	155 (58.5)		
Mobile data	104 (28,2)	50 (48.1)	54 (51.9)	1.312	0.252
<b>Monthly mobile bill</b>					
100-200 Tk	169 (45.8)	71 (42.0)	98 (58.0)		
200-300 Tk	89 (24.1)	37 (41.6)	52 (58.4)	0.790	0.674
Above 300 Tk	111 (30.1)	52 (46.8)	59 (53.2)		
<b>Mostly used social media sites</b>					
Youtube	66 (17.8)	24 (36.4)	42 (63.6)		
Facebook	124 (33.5)	56 (45.2)	68 (54.8)	1.650	0.648
Whatsapp	10 (2.7))	4(40.0)	6 (60.0)		
All	170 (45.9)	76 (44.7)	94 (55.3)		

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<b>Time spend on social media sites</b>					
1 hour	25 (6.8)	1 (4.0)	25 (96.0)		
1 hour-2 hours	104 (28.1)	28 (17.5)	76 (73.1)	45.335	<b>0.00</b>
3-4 hours	117 (31.6)	54 (46.2)	63 (53.8)		
Above 4 hours	124 (33.5)	77 (62.1)	47 (37.9)		
<b>Time spend on mobile phone (calls only)</b>					
Less than 30 min	201 (54.3)	83 (41.3)	118(58.7)		
30 min-1 hour	77 (20.8)	37 (48.1)	40 (51.9)	1.039	0.595
1 hour-2 hours	92 (24.9)	40 (43.5)	52 (56.5)		
<b>Lose sleep due to late night internet activity at least once a week</b>					
Yes	177 (47.8)	124 (70.1)	53 (29.9)	99.399	<b>0.00</b>
No	193 (52.2)	36(18.7)	157 (81.3)		

\*MPD, Mobile phone dependent

**Table 4.2** shows the prevalence (95% CI) of mobile phone dependence in relation to a range of socio-demographic and behavioral characteristics. The prevalence of the mobile phone dependence was 42.2 %. **Table 4.2** also shows the association of mobile phone dependence with various explanatory factors using the Chi-square ( $\chi^2$ ) test of

independence. Findings indicate that age ( $p=0.031$ ), monthly family income ( $p=0.037$ ), time spend on social media ( $p<0.001$ ) and lose sleep due to late night internet activity ( $p<0.001$ ) were significantly associated with mobile phone dependence.

### 4.4 Logistic Regression

**Table 4.3** Binary logistic regression analysis of variables associated with mobile phone dependence

Variables	Coefficient $\beta$	P value	Exp Ratio ( $\beta$ ),Odds	95% CI	
				Upper	Lower
<b>Age</b>					
<25 years	1.623	<b>0.002</b>	5.068	1.847	13.905
> 25 years <sup>RC</sup>					
<b>Gender</b>					
Male	-0.102	0.719	0.903	0.517	1.576
Female <sup>RC</sup>					
<b>Education level</b>					
Undergraduate	1.015	<b>0.017</b>	2.579	1.200	6.346
Postgraduate <sup>RC</sup>					
<b>Family income (Monthly)</b>					
10000-20000 Tk	0.589	0.070	1.803	0.954	3.407
20000-30000 Tk	0.669	0.077	1.952	0.931	4.091
Above 30000 Tk <sup>RC</sup>					
<b>Purpose of using Mobile Phone</b>					
Business	2.101	0.581	8.174	0.981	1.612
Study	-1.031	0.215	0.357	0.070	1.822
Communication and Entertainment	-0.481	0.531	0.618	0.137	2.784
Communication and Study	-0.043	0.948	0.958	0.262	3.502
Study, Communication and entertainment					
<b>Type of internet connection</b>					
Wi-Fi	0.590	0.089	1.805	0.913	3.567

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Mobile data <sup>RC</sup>					
<b>Monthly mobile bill</b>					
100-200 Tk	-0.730	0.052	0.482	0.230	1.007
200-300 Tk	-0.386	0.322	0.680	0.680	1.459
Above 300 Tk <sup>RC</sup>					
<b>Mostly used social media sites</b>					
Youtube	-0.169	0.671	0.845	0.388	1.841
Facebook	-0.194	0.537	0.824	0.445	1.526
Whatsapp	-1.086	0.190	0.338	0.067	1.710
All <sup>RC</sup>					
<b>Time spend on social media sites</b>					
1 hour	1.790	<b>0.001</b>	5.989	1.375	3.781
1 hour-2 hours	1.166	<b>0.001</b>	3.209	1.564	6.584
3-4 hours	0.610	0.065	1.840	0.964	3.513
Above 4 hours <sup>RC</sup>					
<b>Time spend on mobile phone(calls only)</b>					
Less than 30 min	0.184	0.590	1.202	0.616	2.347
30 min-1 hour	0.280	0.486	1.323	0.602	2.908
1 hour – 2 hours <sup>RC</sup>					
<b>Lose sleep due to late night internet activity at least once a week</b>					
Yes	-2.310	<b>0.000</b>	0.099	0.057	0.174
No <sup>RC</sup>					

\*RC, Reference Category

**Table 4.3** presents the effect of different covariates on mobile phone dependence among university students by using binary logistic regression. In the logistic regression model, after full adjustments, there was robust evidence of 5.068 times and 2.579 times higher odds of mobile phone dependence among young (<25 years) and undergraduate respondents (AOR=2.579, 95% CI 1.200- 6.346). Respondents who spend 1 hour on social media had 5.989 times higher odds of mobile phone dependence than those who spend 4 hours (AOR=5.989, 95% CI 1.37-3.781). It is also evident that, respondent who lose sleep due to late night internet activity had 0.099 times lower odds of mobile phone dependence than those who do not lose sleep (AOR=0.099, 95% CI 0.057-0.174).

### DISCUSSION

Although mobile phone usage has increased across all areas, university students are the largest consumer group for mobile phone services (Milena et al., 2012). Maladaptive usage of mobile phones has been recognized and connected to psychological dysfunction, health issues, and even psychiatric diseases, despite the many fascinating and beneficial purposes mobile phones serve in modern life (Choliz et al., 2016). Mobile phone dependency can be considered a novel diagnostic entity due to its characteristics of excessive usage, withdrawal, tolerance, and adverse effects (Bragazzi et al., 2014). However, this study aimed to assess

the prevalence of mobile phone addiction and identify the factor associated with mobile phone addiction among university students in Bangladesh. Among 370 respondents, the overall prevalence of mobile phone dependence was 42.2%. From the binary logistic regression, it is apparent that age, education level, time spend on social media sites and lose sleep due to late night internet activity were significantly influencing mobile phone dependence, where age, education level and time spend on social media sites were positively associated with mobile phone dependence.

The prevalence of mobile phone dependence among university students in Bangladesh, as evident in this study, was higher than in other countries, such as Maharashtra, India 24.65 % (Prekshaa et al., 2019), Nepal 21.8 % (Kriti Thapa et al., 2020) and China 29.8 percent (Mei et al., 2018). In the same way, 36.7% of people at an Iranian medical university used their phones excessively (Jahanshir et al., 2014). On the other hand, a study conducted by Pallabi et al., (2017) among undergraduate medical students in West Bengal, India where the prevalence was 42.6% which is similar to this study.

These disparities could be attributable to the usage of various instruments and classification schemes. Moreover, the contradictions may be attributable to variances between study participants. However, all of these data have shown that there is a problem with mobile phone dependence among students, and it is a problem that is widespread. According to the findings of a number of researches, the widespread

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prevalence rate of the condition is an indication that it may pose a threat to health.

This study has revealed association between age and mobile phone dependence, which is consistent with the conclusions reported by a number of earlier studies. According to a research by AzraDaei et al. (2019) and Mayakal et al., (2019), age was significantly related to mobile phone reliance. In contrast, study by Kriti Thapa et al., (2020) found that there was no association with between age mobile phone dependence and a study by Padmini et al. (2018) also found the same thing. However, future studies with larger age groups will be needed to clarify the relationship between age and mobile phone dependence.

In this study, there was no significant connection between gender and mobile phone dependency. This is consistent with the findings of a study conducted by Kriti Thapa et al., (2020). According to Bianchi and Phillips, there is no distinction between men and women in terms of mobile phone addiction (CHÓLIZ, 2010). But in certain research, female participants show a higher rate of mobile phone dependence than male ones (Domple et al., 2017; Sánchez-Martínez et al., 2009). On the other hand, a study conducted in Iran indicated that males were more likely than females to be addicted to their cell phones (Daei et al., 2019). According to Bianchi and Phillips, women use mobile for social purposes, whereas men use it for technology and job (CHÓLIZ, 2010). There is a clear need for additional research to be conducted in order to get to the bottom of the discrepancy in the incidence of mobile phone dependence between males and females.

In this study, the mobile phone dependence is significant with the time spend on social media sites, that similar to the study conducted on university students in central India by Jain et al. (Prekshaa et al., 2019). Choliz (2010) reported that mobile phone addiction was discovered in an individual who used their phone for nearly two hours. With the advent of the capability to access the internet and social networking sites on mobile devices, the amount of time spent on mobile devices has expanded significantly, hence creating mobile phone addiction.

.This study has found a significant association between mobile phone dependence and education level. This is consistent with the study done by Domple et al., (2017). A study conducted by Myakal et al. (2019) and Dasgupta et al. (2017) discovered that undergraduate third-year students had a greater level of mobile phone dependence. In contrast, a study by Kriti Thapa et al., (2020) found that there was no significant association between mobile phone dependence and academic year.

According to this study, there is no significant association between monthly mobile bills and mobile phone dependence. In contrast, Kriti Thapa et al., (2020) indicated that there was an association between mobile phone dependence and money spend on recharge per month. Similarly, a study conducted in

West Bengal, India, by Choudhury et al. indicated that total mobile recharge is strongly linked with dependence (Sreemedha et al., 2019). Myakal et al. (2019) did a study in Maharashtra, India, and found that the more money people spent on their mobile phones each month, the more dependent they became on them.

This study revealed that, lose sleep due to late night internet activity was negatively associated with mobile phone dependence. But Massimini et al., (2009) discovered that most students can't sleep owing to mobile phone use at least once a week.

A study done by Sahin et al., (2013) found that mobile phone addiction was higher among students with poor family income. But this study revealed that, there was no significant association between monthly family income and mobile phone dependence.

Due to the fact that the questionnaire was self-administered, the outcomes of the present study are dependent on the premise that the students provided truthful responses.

### **CONCLUSION**

The present study found that mobile phone dependence was common among the university students in Bangladesh and is associated age, education level, time spend on social media sites and lose sleep due to late internet activity. This study is especially important in countries like Bangladesh, where mobile phone user is increasing faster than socioeconomic development. The findings of the study may assist the policymakers in identifying the excessive mobile phone users and reducing the overuse of mobile phone. Appropriate preventive measures, such as teachings students about the side effect of mobile phone addiction and counseling for those already addicted to mobile phone, are recommended. Finally, more study is recommended for a proper assessment of mobile phone addiction in Bangladesh, particularly with a nationally representative sample, to decrease non-substance addiction.

### **FUNDING**

No fund has been received.

### **CONFLICTS OF INTEREST**

No conflicts of interest

### **ETHICS APPROVAL**

This study was approved by the project evaluation committee of Statistics Discipline, Khulna University, Bangladesh. In this way, it was carried out in conformity with the Helsinki Declaration's ethical principles from 1964.

### **CONSENT TO PARTICIPATE**

Prior to taking part in the study, each participant read and signed an informed consent form. Each participant was given

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a copy of the detailed study description prior to signing the consent form. They were informed that they might leave the study at any time in this format.

### CONSENT FOR PUBLICATION

Not applicable

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