

From Social Anxiety to Smartphone Addiction: Investigating the Predictive Role of Social Interaction Anxiety in Problematic Smartphone Use among Adults in Dhaka City

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ABSTRACT

Smartphone overuse is recognized as a global pandemic and one of the most pervasive psychological precursors to social anxiety is considered to be the use of smartphones. In the present study, social interaction anxiety was investigated as a predictor of smartphone addiction and the differences in the predictiveness of social interaction anxiety on smartphone addiction were explored among selected demographic groups. A cross sectional quantitative survey design was employed to collect the data from 175 adults (81 male, 94 female) aged 18-60 years from various parts of Dhaka city, Bangladesh. The Bangla version of the Bangla Smartphone Addiction Scale (SAS) and Social Interaction Anxiety Scale (SIAS) were filled out by the participants. Pearson product-moment correlation, independent-samples t-tests, one-way ANOVA and simple linear regression were used in SPSS 25 to analyze data. Social anxiety had positive and significant correlations with total smartphone addiction ($r = .541$; $p < .01$) and all scales of the SAS except for social dysfunction ($r = .034$; $p > .05$). The highest correlations were obtained with scales of withdrawal ($r = .486$; $p < .01$) and cyberspace-oriented relationship ($r = .489$; $p < .01$). Social anxiety significantly explained smartphone addiction, $\beta = .541$, $F(1, 173) = 71.76$, $p < .001$, and accounted for 29.3% of the variance (adjusted R-squared = .289). The scores of social anxiety ($t = -2.324$, $p < .05$) and smartphone addiction ($t = -1.980$, $p < .05$) were significantly higher among participants of extended families than those of nuclear families and socio-economic status was significantly associated with social anxiety, $F(2, 172) = 4.625$, $p < .05$. Gender and educational qualification/occupation were not significantly different. Results provide evidence for compensatory use of smartphones and suggest interventions to be anxiety oriented and family sensitive in urban Bangladesh.

Keywords: Social anxiety, Smartphone addiction, Compensatory use, Family type, Bangladesh

INTRODUCTION

The ubiquity of the smartphone has created a parallel worry over the unchecked use of it, from a device of communication to the central device used to organize contemporary social, occupational and recreational life (Olson et al., 2022). Smartphone Addiction, or Problematic Smartphone Use, as described in the literature, is defined by excessive and poorly controlled smartphone use accompanied by salience, tolerance, discomfort and functional impairment when not using the smartphone in daily life (Kwon et al., 2013). It is not a recognized diagnostic category yet, but has been broadly conceptualized as a behavioral addiction because it shares the key characteristics of craving, loss of control and continued use despite harm (Billieux et al., 2015). A meta-analysis of studies conducted in 24 countries revealed a general increase in scores on the standardized measures of problematic smartphone use over the last few years with the highest scores shown in the Asian samples (Olson et al., 2022). The recent systematic review and meta-analyses of the general population found that the prevalence of digital addiction among the general population was around twenty-seven per cent,

indicating that it is not an isolated phenomenon (Meng et al., 2022). The situation in Bangladesh is no exception either, with a nationally representative study of young adults indicating that 61.4 per cent of young people fulfilled the criteria of a smartphone addiction, with male gender, age, unemployment and size of households being significant sociodemographic risk factors (Ratan et al., 2022). These consequences reported in literature are significant and involve sleep disturbance, decreased physical activity, musculoskeletal complaints, impaired academic performance and increased psychological distress (Demirci et al., 2015). Longitudinal evidence also suggests that mental health problems, academic pressure, peer victimization and family problems are valid predictors of smartphone addiction and not merely its outcomes (Crowhurst & Hosseinzadeh, 2024). Hence, problematic smartphone use is highly prevalent and is functional in its harmful effects, making it an important research priority to understand the psychological vulnerabilities that might contribute to the use of smartphones (Sarhan, 2024).

Social anxiety has been a psychological vulnerability that has received the longest focus, based on its early age of onset, chronic course and significant impact on interpersonal functioning (Heimberg et al., 2014). Social anxiety disorder involves significant and long-lasting fears of social or performance situations in which they might be evaluated negatively or looked upon critically by others (American Psychiatric Association, 2022). This fear is accounted for by cognitive models, which suggest that socially anxious people form an observer-perspective image of themselves that is distorted and that they expect to be rejected, thus using avoidance and safety behaviors to help prevent disconfirmation of their negative self-cognitions (Clark & Wells, 1995). A complementary formulation focuses on the perceived mismatch between what socially anxious individuals think their social audience would expect them to do and how they think of themselves socially (Rapee & Heimberg, 1997). Anxiety disorders are the most common group of mental disorders globally, and global burden of anxiety disorders has increased significantly after the Coronavirus infection (Santomauro et al., 2021). A recent systematic review and meta-analysis found that a significant minority of children, adolescents and youths worldwide suffer from social anxiety disorder and that it has the potential to affect academic, social and occupational functioning (Salari et al., 2024). Importantly, social anxiety can exist on a continuum, with sub clinical levels of social interaction anxiety much more prevalent than the full disorder, and having measurable effects on avoidance of face-to-face contact (Mattick & Clarke, 1998). The developmental literature also indicates that untreated social anxiety solidifies into persistent avoidance behavior, which in turn limits the acquisition of social skills and will ultimately limit the individual's social networks over time (Leigh & Clark, 2018). Social anxiety's high prevalence, interpersonal avoidance and chronicity make it a theoretically interesting explanation for why some individuals may migrate their social life onto the screen (Prizant-Passal et al., 2016).

The conceptual connection between the two constructs is the fact that mediated communication eliminates just the interaction characteristics that are most threatening for socially anxious individuals. The online and/or smartphone-mediated exchanges are asynchronous, non-verbal feedback is primarily mediated in terms of text editing, and the immediate non-verbal feedback is minimized, thereby decreasing appearance concerns and minimizing the perceived cost of social errors (Caplan, 2010). There is now a meta-analysis on social anxiety and internet use that found that socially anxious people have a consistent preference for online over offline relationships and at risk of problematic internet use as a consequence (Prizant-Passal et al., 2016). Empirical studies have demonstrated that the combination of social anxiety and loneliness can differentiate heavy from moderate users, and socially anxious users indicated that they had a more positive attachment to the smartphone (Enez Darcin et al., 2016). The correlation between social anxiety and mobile phone addiction was confirmed in a three-level meta-analysis of the association, which found a significant positive correlation between the two in a large number of samples and over a wide range of instruments used for measuring SMTA (Ran et al., 2022). Mechanistic research suggests that this relationship is not linear, but mediated by other affective and cognitive processes, with rumination being a key factor between social anxiety and problematic use of the smartphone (Elhai et al., 2018). A large-scale study of college students yielded a more recent finding of partial mediation of the relationship between social anxiety and cell phone addiction by loneliness, indicating the importance of unmet relational needs as an intermediate step (Zhou & Feng, 2025). Past research has demonstrated that social anxiety also plays a protective role for problematic smartphone use; that is, a decrease in social anxiety results in a decrease in problematic smartphone use (Song et al., 2024). All the

results point toward the same conclusion, namely that the smartphone acts as a manageable alternative for an actual human face-to-face interaction that is feared but still desired by the socially anxious user (Wang & Ma, 2024).

The Compensatory Internet Use Model (CIUM) is the theoretical framework most appropriate for the organization of this evidence as it suggests that PIT is linked to the use of online environments to regulate negative affect and as a strategy for meeting unmet psychosocial needs (Kardefelt-Winther, 2014). In this context, the problem use is not motivated by the technology per se, but rather by the distress that is temporarily alleviated by the use of the technology, which is why psychopathology is one of the most common correlates of problem use (Panova & Carbonell, 2018). Further, the model of Interaction of Person-Affect-Cognition-Execution proposes that predisposing person variables like trait anxiety interact with affective and cognitive reactions to cues and with reduced executive control, to generate and sustain addictive behaviors (Brand et al., 2019). In the current context, social anxiety is the individual factor, the relief from the anonymity of online interaction is the affective (emotional) and cognitive (thought) response, and the incremental reinforcement of checking the individual's behavior gradually reduces inhibitory control (Brand et al., 2019). Empirical studies of this sequence have been rapidly gaining in number, and anxiety, depression and stress have been related to the problematic use of smartphones among health-science students (Sarhan, 2024). Studies on social networking applications have also revealed that people with high social anxiety and social assurance needs are most at risk of forming compulsive usage patterns (Lee-Won et al., 2015). Studies on social networking addiction suggest that the reinforcement schedules used in notifications and feedback metrics are very effective for hypersensitive social evaluation users (Kuss & Griffiths, 2017). Another anxiety-related mechanism identified as contributing to excessive checking is the fear of missing out and the need to be connected all the time (Elhai et al., 2016). However, social isolation has been found to foster smartphone dependency by causing loneliness and situational anxiety, further highlighting the bidirectional nature of the compensatory cycle (Wang & Ma, 2024). Longitudinal syntheses warn that mental health and smartphone addiction could become mutually reinforcing, one feeding the other as time goes on (Crowhurst & Hosseinzadeh, 2024).

Three gaps are present, however, in the body of existing research to date, and warrant the current investigation: There are three gaps in the existing body of research to date, however, which justify the present investigation: First, the majority of the existing evidence stems from samples in East Asian, European and North American countries while samples of South Asian countries are significantly underrepresented in the literature on social anxiety and problematic smartphone use (Ran et al., 2022). Second, studies in Bangladesh have focused on prevalence, sociodemographic factors associated with the frequency of gaming and predicting behavioral outcomes like nomophobia and academic underachievement, without investigating potential psychological processes that render some subjects more susceptible (Al-Mamun et al., 2023). Third, almost all of the studies conducted so far have involved university students, and little is known about whether the same associations occur in a community sample of adults with varying occupations, education and household structure (Sayeed et al., 2021). This is important as family structure in Bangladesh is unique, extended households are still prevalent and because extended families also impact social support and social evaluation (Faisal et al., 2022). Therefore, the rationale for the present study is to test the generalizability of the relationship between social anxiety and smartphone addiction largely observed in the student population of Western and East Asian countries to an urban South Asian adult population and whether culturally salient variables such as family type and socio-economic status differentiate the levels of social anxiety and smartphone addiction in adults from South Asian countries (Ratan et al., 2022). This evidence can be used practically as interventions targeting underlying anxiety are likely to have greater persistence and as there are limited resources for mental health in Bangladesh, interventions are more likely to have a greater impact on those most at risk.

The current study achieved five related aims in light of the above considerations. The first was to explore the association of social interaction anxiety with the six dimensions of problematic use of the smartphone, namely daily-life disturbance, positive anticipation, withdrawal, overuse, tolerance and cyberspace-oriented relationship (Kwon et al., 2013). The second was to determine if social interaction anxiety is a statistically significant predictor of smartphone addiction and the amount of variance in problematic use that it accounts for, thus directly testing the compensatory use account (Kardefelt-Winther, 2014). The third one was to look

into the differences between men and women in regards to their social anxiety and smartphone addiction, as previous studies had mixed results (Song et al., 2024). The fourth was to determine if there were differences in either construct related to socio-economic status, educational qualification and occupation, as these are indicators of structural inequalities which affect psychological distress and device use patterns (Ratan et al., 2022). The fifth aim was to investigate the difference between nuclear and extended household on social anxiety and smartphone addiction, which is very much culturally relevant in the Bangladeshi context and has not been examined in the literature except for few studies in the international literature (Crowhurst & Hosseinzadeh, 2024).

METHODOLOGY

Research Design

The design of this study is quantitative, cross section, correlational, and survey. This design serves as a good choice if you want to measure the strength of naturally occurring associations between continuous psychological measures in a single moment in time versus if you want to establish temporal precedence (Zhou & Feng, 2025). The variables to be treated as predictor variables were: social interaction anxiety, the criterion variables were: total smartphone addiction score and the grouping variables were: gender, educational qualification, occupation, socio-economic status and family type. This study was carried out and presented according to the standard practice in observational psychological research and no experimental manipulation or follow up assessment was done (Crowhurst & Hosseinzadeh, 2024).

Participants and Sampling

A total of 175 adults were selected from various locality of Dhaka City, Bangladesh for the study. Of the 81 participants (46.3%) were men and 94 (53.7%) women and their ages ranged from 18-60 years. A non-probability purposive sampling method with an unstructured quota sampling technique was used to recruit the participants, where the sample included participants from a variety of occupational categories, levels of education, household structures and socio-economic strata rather than a single homogeneous group (Sayeed et al., 2021). Almost all the participants were from nuclear families (63.4%) while 36.6% were from extended families. The distribution of the self-reported socio-economic status was lower ($n = 25$), middle ($n = 139$) and upper ($n = 11$). The educational qualification included Secondary School Certificate ($n = 31$), Higher Secondary Certificate ($n = 48$), graduate ($n = 51$) and post-graduate ($n = 45$) levels. The occupations included students ($n = 82$), homemakers ($n = 30$), service holders ($n = 38$), businesspersons ($n = 18$) and unemployed participants ($n = 7$). Individuals aged 18 years and above who owned and personally used a smart phone, were literate in Bangla and were willing to give informed consent were approached; however, people with current diagnosis of severe psychiatric and neurological disorder were not approached. A post hoc sensitivity analysis suggested that a sample of 175 would have .80 power to find a 0.21 correlation at an alpha level of .05 (two tailed) assuming medium-sized effects, based on the previous meta-analytical evidence (Ran et al., 2022).

Measures

Two sets of standardized self-reported questionnaires, plus a brief demographic information sheet completed by the investigator, collecting information about age, gender, educational qualification, occupation and monthly family income and family type were administered. All instruments were given in Bangla.

Smartphone Addiction Scale (SAS)

Smartphone addiction was assessed using Bangla version of Smartphone Addiction Scale developed and validated by Kwon et al., (2013). The instrument is composed of 33 items on a 6-point Likert scale from 1 (disagree strongly) to 6 (agree strongly); the end score range is from 33 to 198, with higher scores representing higher levels of the symptom of smartphone dependency. The scale is broken down into six sub scores that were theoretically derived: daily-life disturbance, positive anticipation, withdrawal, overuse, tolerance and cyberspace-oriented relationship (Kwon et al., 2013). Cronbach alpha coefficients for the six subscales ranged

from .711 to .857 and .794 for the total scale, respectively, for positive anticipation, overuse, withdrawal, daily-life disturbance, tolerance and cyberspace-oriented relationship, and were acceptable to good. The adapted items were expert reviewed for content validity, and significant correlation ($r = .634$) was found between the total SAS score and the Internet Addiction Test, with each of the six SAS sub scores having a positive correlation with the four sub scores of the latter. These psychometric measures are similar to the other cultural adaptation of the same measure and justify the use of the measure in the Bangladeshi context (Sarhan, 2024).

Social Interaction Anxiety Scale (SIAS)

Social anxiety was assessed using the Social Interaction Anxiety Scale, designed to assess social interaction anxiety specific to dyadic and group interaction situations, and not performance or observation situations (Mattick & Clarke, 1998). The scale consists of 20 items each scored on a Likert type scale from 0 to 4, with total scores ranging from 0 to 80, with higher scores indicating higher levels of social interaction anxiety. Conventional severity bands (slight 0-20, moderate 21-40, very much 41-60 and extreme 61-80) were used for the interpretation of scores. The instrument has been shown to be highly internally consistent; highly test-retest reliable; and highly convergent with and diagnostic for social interaction anxiety in clinical and community samples, and is one of the most widely used continuous measures of social interaction anxiety in the literature (Mattick & Clarke, 1998). To avoid the influence of sexual orientation on the difficulty of communicating with an attractive potential partner, item 14 was worded in a non-heteronormative manner (Leigh & Clark, 2018). The reliability of the instrument was determined by the Cronbach alpha coefficient which was .98, very good.

Procedure and ethical considerations

Data were obtained in-person using a standardized administration protocol across various residential, educational and commercial locations of Dhaka city. All potential participants received a detailed verbal and written summarization of the aims of the study, estimated time to complete it, information about voluntary participation and their right to withdraw at any point during the process without penalty. Following the completion of the questionnaires, formal written consent was obtained and a rapport was established. Consequently, participants were then asked to read each item carefully, respond as truthfully as possible and note the first thought that came into their mind rather than spend a long time deliberating.

They were allowed to fill out survey questionnaires in their own environment to minimize evaluative pressure, an important consideration with socially anxious respondents (Clark & Wells, 1995). Respondents were told that their answers would be kept anonymous, that no personally identifiable information would be stored and that the data would solely be used for research. Once completed, questionnaires were screened on collection for missing responses and durably thanked for their contribution. The study was performed in accordance with the Declaration of Helsinki and ethical code of conduct for psychological research, with the protocol approved by the departmental research and ethics committee of the host institution (Zhou & Feng, 2025).

Data Analysis

Completed questionnaires were collated, and coded entries were entered into the Statistical Package for the Social Sciences version 25 for Windows, and ten per cent of records were independently re-entered to confirm accuracy of transcription. Preliminary screening of missing values, univariate outliers and the distributional properties of both composite scores were examined, as well as even more formal tests of the assumptions underlying parametric analysis prior to hypothesis testing. Using a histogram with an overlaid normal curve and a normal probability plot, the residuals of the regression were verified to be normally distributed; linearity and homoscedasticity were evaluated using standardized prediction values against their associated standardized residual in a scatterplot and no violations that would contraindicate parametric procedures.

Descriptive statistics were calculated for study variables. Statistical Analyses Pearson product-moment correlation coefficients were computed to assess the relationship between social anxiety and total smartphone

addiction as well as those for each of the 6 subscales of problematic use. Men were compared with women and nuclear family with extended family by independent-samples t-tests, while one-way analysis of variance was used to compare the three socio-economic strata and the four educational categories and the five occupational categories. We employed simple linear regression to determine social interaction anxiety as a predictor of total smartphone addiction, with a direct assessment of the overall model by F-test and estimation of magnitude estimates of prediction expressed through R, R-squared, adjusted R-squared and standardized regression coefficient. All tests were two-tailed, and alpha was set at statistical significance of. 05, with results at $p < .01$ and $p < .001$ where acquired (Sarhan, 2024).

RESULTS

The sample size of the finished questionnaires was analyzed using descriptive and inferential statistics based on the objectives of the study. Preliminary checks were performed prior to any analyses to confirm that the assumptions of normality, linearity and homoscedasticity required for parametric analysis were not violated. Results The results are presented below in the order of correlation, descriptive statistics, regression, residual diagnostics and group comparisons only statistically significant values being interpreted in the text.

Correlations among social anxiety and the dimensions of smartphone addiction

Table 1. Correlations among social anxiety and smartphone addiction with its six factors

Variable	1	2	3	4	5	6	7	8
1. Social anxiety	-							
2. Daily-life disturbance	.191*	-						
3. Positive anticipation	.416**	.253**	-					
4. Withdrawal	.486**	.181*	.624**	-				
5. Overuse	.369**	.343**	.428**	.504**	-			
6. Tolerance	.418**	.353**	.456**	.465**	.681**	-		
7. Cyberspace-oriented relationship	.489**	.166*	.626**	.702**	.512**	.477**	-	
8. Smartphone addiction (total)	.541**	.475**	.818**	.820**	.713**	.708**	.817**	-

Note. N = 175. * $p < .05$. ** $p < .01$.

Pearson product-moment correlations between social anxiety, total smartphone addiction and the six subscales of problematic smartphone use are summarized in Table 1. RESULTS A second-order confirmatory factor analysis (CFA) revealed a robust model with sufficient fit for data on social anxiety and total smartphone addiction, $r = .541$, $p < .01$, indicating a large effect. Likewise, each subscale of the Smartphone Addiction Scale (cyberspace-oriented relationship) was positively and significantly related to social anxiety: $r = .489$, $p < .01$; withdrawal, $r = .486$, $p < .01$; tolerance, $r = .418$, $p < .01$ anticipation plus, $r = .416$, $p < .01$; overuse, $r = .369$, $p < .01$; and daily-life disturbance, $r = .191$, $p < .05$.

Thus, the strongest associations were between withdrawal and cyberspace-oriented relationship dimensions, and the weakest were associated with daily-life disturbance. The total score was most strongly correlated with withdrawal, $r = .820$, $p < .01$, expectation positive, $r = .818$, $p < .01$. In data date in October 2023, training train out 01, and cyber relationship space-oriented, $r = .817$, $p < .01$.

Descriptive statistics

Table 2. Mean and standard deviation of smartphone addiction and social anxiety

Variable	Mean	Std. Deviation	N
Smartphone addiction	112.5657	25.72500	175
Social anxiety	31.1029	13.56850	175

The means and standard deviations of the two composite measures are presented in Table 2. The average total smartphone addiction score was 112.57 (SD = 25.73) and the mean social anxiety score was 31.10 (SD = 13.57), for the full sample of N=175 participants. The sample mean is within the moderate level of social interaction anxiety when considering significant bands in The Social Interaction Anxiety Scale.

Regression of smartphone addiction on social anxiety

Table 3. Overall F-test for the regression of smartphone addiction on social anxiety

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	33760.128	1	33760.128	71.760	.000
Residual	81388.866	173	470.456		
Total	115148.994	174			

Note. Predictor: (Constant), Social anxiety. Dependent variable: Smartphone addiction.

Table 3 displays the variance analysis for the regression model. The comprehensive model demonstrated statistical significance, $F(1, 173) = 71.760$, $p < .001$, suggesting that the influence of social anxiety on smartphone addiction was markedly higher than random fluctuation.

Table 4. Selected statistics from the regression of social anxiety on smartphone addiction

Variable	R	R ²	Adjusted R ²	p
Social anxiety	.541	.293	.289	.000

Note. Predictor: (Constant), Social anxiety. Dependent variable: Smartphone addiction.

Table 4 presents the chosen regression statistics. Social anxiety exhibited a multiple correlation of $R = .541$ with smartphone addiction, $p < .001$, elucidating 29.3% of the overall variation in smartphone addiction (R -squared = .293), whereas the adjusted figure revealed that 28.9% of the variance was accounted for after adjusting for model complexity.

Table 5. Regression coefficients for social anxiety predicting smartphone addiction

Model	B	Std. Error	β	t	p
(Constant)	80.636	4.110		19.618	.000
Social anxiety	1.027	.121	.541	8.471	.000

Note. Dependent variable: Smartphone addiction.

Table 5 presents the regression results. Social anxiety was a significant positive predictor of smartphone addiction, $B = 1.027$, $SE = .121$, $\beta = .541$, $t = 8.471$, $p < .001$, meaning per a one-point increase in the Social Interaction Anxiety Scale predicting an one point increase on Smartphone Addiction Scale. The constant was also important, $B = 80.636$, $t = 19.618$, $p < .001$.

Regression Diagnostics

Figure 1. Histogram of regression standardized residuals with normal curve

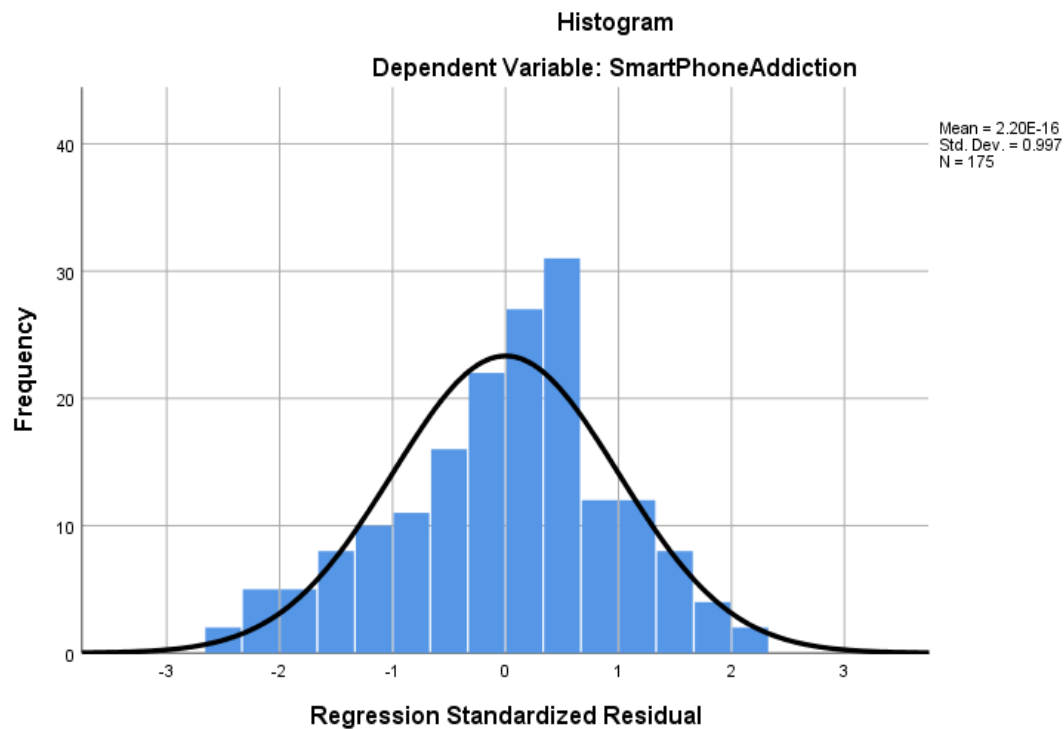


Figure 2. Normal P-P plot of regression standardized residuals

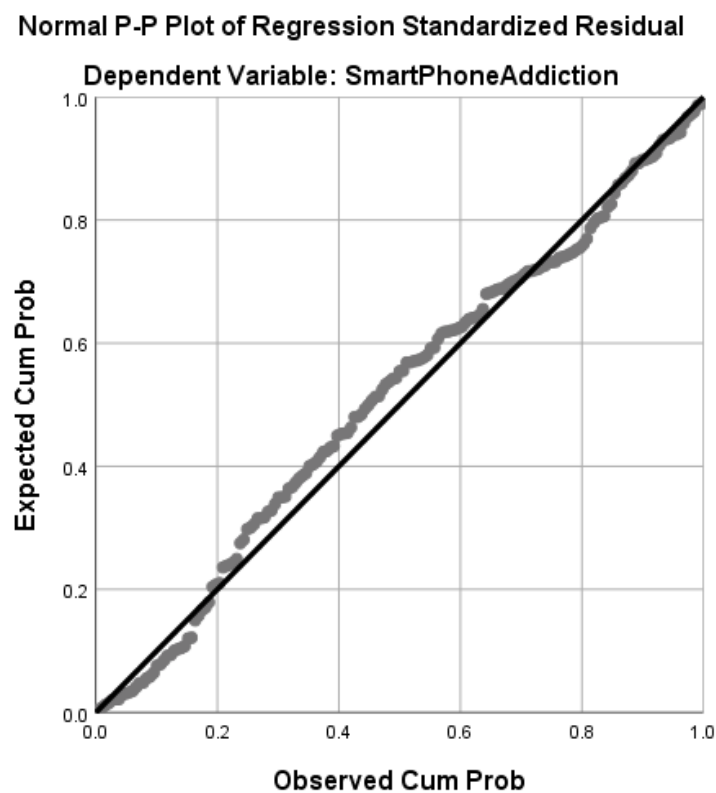
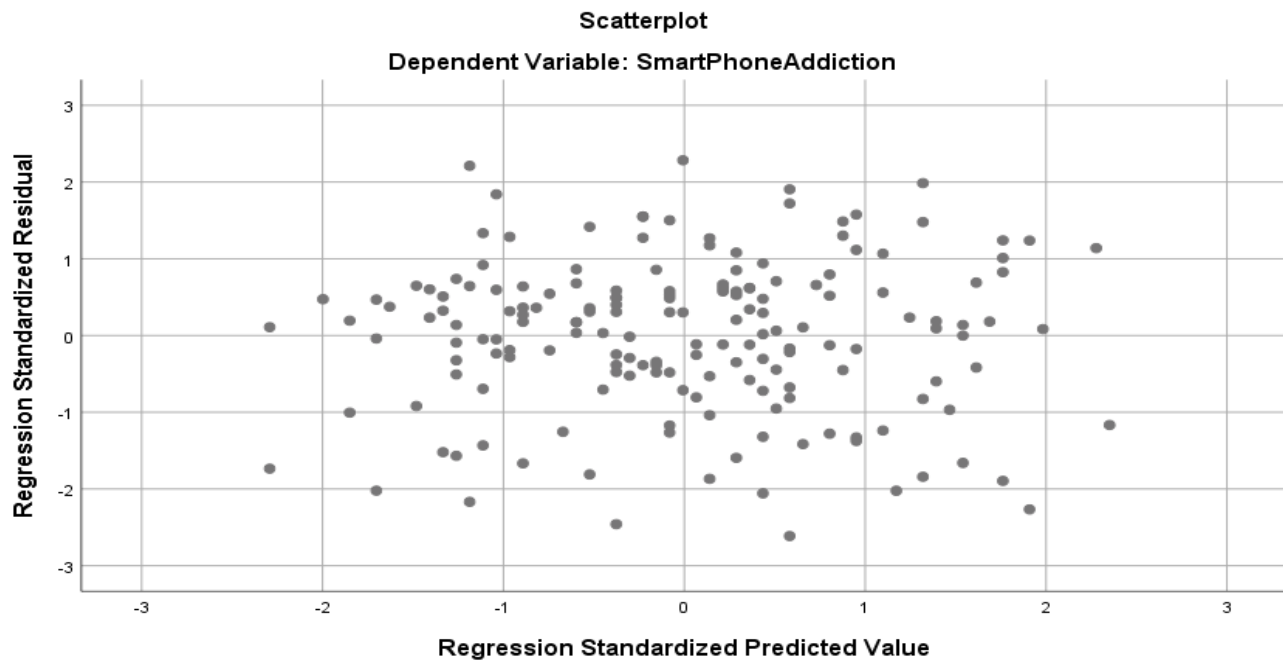


Figure 3. Scatterplot of regression standardized residuals against standardized predicted values



Figures 1 through 3 illustrate the residual diagnostics pertaining to the regression model. The histogram depicted in Figure 1 illustrates that the standardized residuals were roughly normally distributed, centered around a mean of $2.20\text{E-}16$ and had a standard deviation of .997 for the 175 instances. The standard probability plot depicted in Figure 2 illustrates that the observed cumulative probabilities align closely with the diagonal reference line, so reinforcing the normalcy assumption. The scatterplot in Figure 3 illustrates that the standardized residuals are randomly dispersed around zero throughout the spectrum of standardized predicted values, exhibiting no signs of funneling or curvature, so confirming the fulfillment of homoscedasticity and linearity assumptions.

Comparison by Gender and Family Type

Table 6. Independent-samples t-test of social anxiety with demographic variables

Variable	Group	N	Mean	Std. Deviation	t	Sig.
Gender	Male	81	29.1111	13.39310	-1.814	.071
	Female	94	32.8191	13.55432		
Family type	Nuclear	111	29.3153	13.65682	-2.324	.021
	Extended	64	34.2031	12.93964		

Table 6 displays the independent-samples t-tests that analyse social anxiety in relation to gender and family structure. The disparity between males ($M = 29.11$, $SD = 13.39$) and females ($M = 32.82$, $SD = 13.55$) was not statistically significant, $t = -1.814$, $p = .071$. The variance based on family type was statistically significant, $t = -2.324$, $p = .021$, with individuals from extended families exhibiting more social anxiety ($M = 34.20$, $SD = 12.94$) compared to those from nuclear households ($M = 29.32$, $SD = 13.66$).

Table 7. Independent-samples t-test of smartphone addiction with demographic variables

Variable	Group	N	Mean	Std. Deviation	t	Sig.
Gender	Male	81	114.2840	25.75473	.819	.414
	Female	94	111.0851	25.74468		
Family type	Nuclear	111	109.6667	25.25410	-1.980	.049
	Extended	64	114.2840	25.75473		

Variable	Group	N	Mean	Std. Deviation	t	Sig.
	Extended	64	117.5938	25.95583		

This is shown in Table 7 for smartphone addiction. There was no significant difference between men ($M = 114.28$, $SD = 25.75$) and women ($M = 111.09$, $SD = 25.74$), $t = .819$, $p = .414$. The difference by family type was significant with $t = -1.980$, $p = .049$, with higher levels of smartphone addiction in participants from extended families ($M = 117.59$, $SD = 25.96$) compared to those from nuclear families ($M = 109.67$, $SD = 25.25$).

Comparison by Socio-Economic Status

Table 8. Mean and standard deviation of social anxiety by socio-economic status

Socio-economic status	N	Mean	Std. Deviation	Std. Error
Lower	25	38.2000	14.02676	2.80535
Middle	139	30.2158	13.06437	1.10811
Upper	11	26.1818	14.57270	4.39383
Total	175	31.1029	13.56850	1.02568

Table 9. One-way ANOVA of social anxiety by socio-economic status

Source	Sum of Squares	df	Mean Square	F	Sig.
Between groups	1634.987	2	817.494	4.625	.011
Within groups	30399.162	172	176.739		
Total	32034.149	174			

The descriptive statistics and one-way analysis of variance for social anxiety with respect to socio-economic strata are displayed in Tables 8 and 9. There was a statistically significant effect of socio-economic status on social anxiety, $F(2, 172) = 4.625$, $p = .011$. Examination of the group means reveals a monotonic decrease ranging from group low ($M = 38.20$, $SD = 14.03$), to mid-range ($M = 30.22$, $SD = 13.06$), and finally high ($M = 26.18$, $SD = 14.57$).

Table 10. Mean and standard deviation of smartphone addiction by socio-economic status

Socio-economic status	N	Mean	Std. Deviation	Std. Error
Lower	25	114.9600	30.55389	6.11078
Middle	139	112.9928	24.01796	2.03718
Upper	11	101.7273	34.17043	10.30277
Total	175	112.5657	25.72500	1.94463

Table 11. One-way ANOVA of smartphone addiction by socio-economic status

Source	Sum of Squares	df	Mean Square	F	Sig.
Between groups	1460.860	2	730.430	1.105	.334
Within groups	113688.135	172	660.978		
Total	115148.994	174			

Smartphone addiction was analyzed equivalently and this is shown in Tables 10 and 11. Socio-economic status did not significantly affect smartphone addiction, $F(2, 172) = 1.105$, $p = .334$, while the group means were

similarly ordered by descent from the lower group ($M=114.96$), through the middle group ($M=112.99$) to the upper group ($M=101.73$).

Comparison by Educational Qualification

Table 12. Mean and standard deviation of social anxiety by educational qualification

Educational qualification	N	Mean	Std. Deviation	Std. Error
S.S.C	31	33.8065	13.08031	2.34929
H.S.C	48	31.3542	12.37618	1.78635
Graduate	51	32.2745	13.90119	1.94656
Post graduate	45	27.6444	14.46179	2.15584
Total	175	31.1029	13.56850	1.02568

Table 13. One-way ANOVA of social anxiety by educational qualification

Source	Sum of Squares	df	Mean Square	F	Sig.
Between groups	837.863	3	279.288	1.531	.208
Within groups	31196.286	171	182.434		
Total	32034.149	174			

Descriptive statistics and analysis of variance for social anxiety across educational qualification (Tables 12 and 13). There was no statistically significant effect, $F(3, 171) = 1.531$, $p = .208$. Participants highest level of education was also associated with differences in Facebook and Instagram use: Participants educated to Secondary School Certificate level reported the highest mean ($M = 33.81$) while postgraduate participants reported the lowest ($M = 27.64$).

Table 14. Mean and standard deviation of smartphone addiction by educational qualification

Educational qualification	N	Mean	Std. Deviation	Std. Error
S.S.C	31	120.0968	26.73868	4.80241
H.S.C	48	112.7917	28.94526	4.17789
Graduate	51	111.2353	23.24959	3.25559
Post graduate	45	108.6444	23.71819	3.53570
Total	175	112.5657	25.72500	1.94463

Table 15. One-way ANOVA of smartphone addiction by educational qualification

Source	Sum of Squares	df	Mean Square	F	Sig.
Between groups	2542.880	3	847.627	1.287	.280
Within groups	112606.114	171	658.515		
Total	115148.994	174			

Tables 14 and 15 provide a corresponding examination of smartphone addiction. The impact was not statistically significant, $F(3, 171) = 1.287$, $p = .280$, with averages varying from 120.10 for individuals with a Secondary School Certificate to 108.64 for those with postgraduate education.

Comparison by Occupation

Table 16. Mean and standard deviation of social anxiety by occupation

Occupation	N	Mean	Std. Deviation	Std. Error
Student	82	32.4024	13.56726	1.49825
Housewife	30	29.3667	12.62860	2.30566
Service	38	30.3158	15.02090	2.43671
Business	18	29.5556	11.50050	2.71069
Unemployed	7	31.5714	16.35907	6.18315
Total	175	31.1029	13.56850	1.02568

Table 17. One-way ANOVA of social anxiety by occupation

Source	Sum of Squares	df	Mean Square	F	Sig.
Between groups	297.093	4	74.273	.398	.810
Within groups	31737.055	170	186.689		
Total	32034.149	174			

Tables 16 and 17 illustrate the descriptive statistics and variance analysis about social anxiety among different job groups. The impact was not statistically significant, $F(4, 170) = .398$, $p = .810$, with group averages tightly grouped between 29.37 and 32.40.

Table 18. Mean and standard deviation of smartphone addiction by occupation

Occupation	N	Mean	Std. Deviation	Std. Error
Student	82	113.9146	24.19785	2.67221
Housewife	30	104.2000	29.37909	5.36386
Service	38	115.4474	21.93688	3.55863
Business	18	106.8889	30.23416	7.12626
Unemployed	7	131.5714	24.73767	9.34996
Total	175	112.5657	25.72500	1.94463

Table 19. One-way ANOVA of smartphone addiction by occupation

Source	Sum of Squares	df	Mean Square	F	Sig.
Between groups	5672.905	4	1418.226	2.202	.071
Within groups	109476.089	170	643.977		
Total	115148.994	174			

Tables 18 and 19 provide a corresponding examination of smartphone addiction. The outcome did not attain statistical significance, $F(4, 170) = 2.202$, $p = .071$, despite unemployed individuals exhibiting the highest mean score ($M = 131.57$) and homemakers the lowest ($M = 104.20$).

DISCUSSION

The current study aimed to find out the predictive nature of social interaction anxiety on smartphone addiction in a community-based adult sample from Dhaka city, with the second goal being to examine whether and how these 2 constructs across demographic strata. The results responded to all five aims and, collectively as a set, told a clear story: social anxiety plays an important but moderately-sized role in predicting problematic smartphone use (with the relation being statistically significant), it appears to principally exert its influence via the relational addiction and withdrawal subtypes of addiction rather than through the other two constructs, and while household structure and economic position patterned such relationships household context did not pattern across gender/education/occupation categories (Zhou & Feng, 2025).

Social Anxiety and Smartphone Addiction

The correlation of $r = .541$ represent a large effect by conventional standards (Morel et al., 2009) and exceed pooled estimates reported from international syntheses of this relationship (Ran et al., 2022). The nature of the association is wholly in line with the compensatory internet use model, which posits that people who have difficulty interacting in face-to-face contexts seek mediated environments to receive the social contact they cannot comfortably achieve offline (Kardefelt-Winther, 2014). The effect sizes found here are also in line with previous work demonstrating that social anxiety and loneliness jointly distinguish heavy from moderate smartphone users (Enez Darcin et al., 2016). The fact that the association was greater than typical published estimates could be due to the community composition of the sample with students being more homogeneous in their experience of structured face-to-face social contact than a mixed adult population (Sayeed et al., 2021). Or, the urban density and social evaluation pressures of Dhaka are exacerbating apparent offline interaction costs for anxious persons making the compensatory draw of the device stronger (Faisal et al., 2022).

This pattern at the subscale level provides much more information and specificity than what was returned from the general analysis of the association presented in the introduction. The strongest correlation was found between withdrawal and social anxiety ($r = .486$) and with cyber-cyber relationship ($r = .489$), and much less strongly with interference in daily life ($r = .191$). The implication of this pattern is that socially anxious participants are not just spending longer on their phones but transferring their relational life into the online sphere and feeling uncomfortable when, in effect, they are separated from it – exactly the profile applied in cognitive models of social anxiety where developing behavior works as a protection strategy (Clark & Wells, 1995). The moderate association with daily-life disturbance fits with the idea that early on in the process, this compensatory strategy is more experienced as effective than disruptive (Brand et al., 2019), as formulated in the Interaction of Person-Affect-Cognition-Execution model. Moderate correlation with positive anticipation ($r = .416$) also is in line with the interpretation that, rather than pleasure alone, anticipated relief — which offers a greater resilience potential to the anxious user — may promote engagement with the device (Elhai et al. Dimension-specific problems patterns were also reported in studies that looked not at a unitary construct of problematic use but rather examined facets of the problem separately (Kwon et al., 2013).

Social Anxiety as A Predictor Of Problematic Use

The multiple regression analysis offered a direct test of the second hypothesis and established social interaction anxiety as a significant predictor of smartphone addiction, $F(1, 173) = 71.76$, $p < .001$ with a standardized coefficient of .541 and the adjusted R-squared is .289. Since the unstandardized coefficient equal to 1.027, indicates that each extra point on the SIAS is associated with about an extra point of total SAS. In other words these changes are clinically meaningful given the score ranges of both measures. In fact, explaining almost thirty per cent of the variances in problematic use from a single psychological predictor is quite an achievement and even compares well to multivariable models into which several correlated psychological variables are entered at once (Sarhan, 2024). This finding augmented by the recent large-sample evidence showing that social anxiety directly but also indirectly predicts smartphone addiction, mediated by loneliness (Zhou & Feng, 2025). It further aligns with research on social anxiety, demonstrating that treatments targeting reduced social anxiety, like structured physical activity programs (Song et al., 2024), also result in

reductions of problematic smartphone use. Equally the seventy per cent of variance that remains unexplained serves as a reminder that social anxiety represents just one vulnerability among others and that rumination, boredom proneness, impulsivity, depressive symptoms and situational features all play a role in the etiology of the behavior (Elhai et al., 2018).

And the descriptive statistics provide an essential caveat to this predictive narrative. The overall sample evidenced a moderate to high level of problematic use with an mean smartphone addiction score is 112.57 (SD = 25.73), whilst the mean social anxiety score was also in line with the moderate band of SIAS at 31.10 (SD = 13.57). This means that the superior smartphone engagement was being reported by high, but not low social anxiety participants regardless of their level of social anxiety, suggesting that while increased levels of smartphone use is absent in all individuals it only becomes significant to a certain percentage (levels) which ultimately suggests that social anxiety accounts for variance in severity but not whether this behavior occurs at all. These population-level phenomena are in accordance with human-nature research evidence showing that problematic smart phone use is now within the normative range, and increasing across nations with its base rate determined more by the affordances of our technology and our everyday lives than psychopathology (Olson et al., 2022). This same conclusion was supported by the extremely high rate of smartphone addiction found in a sample of Bangladeshi young adults (Ratan et al., 2022). Similarly, analyses at the population level suggest that heavy engagement with screen-based activities is linked to small but statistically significant reductions in wellbeing for entire cohorts of young people rather than simply among those identified as clinically vulnerable (Twenge & Campbell, 2018). In practical terms, this means that universal digital wellbeing measures and targeted psychological intervention are addressing different aspects of the issue, thus their work is complementary rather than substitutive (Crowhurst & Hosseinzadeh 2024).

Demographic Variation

Neither the overall social anxiety ($t = -1.814$, $p = .071$) or addiction to smartphones ($t = .819$, $p = .414$) relates to the third goal and must be interpreted with caution. While women scored slightly higher on social anxiety and men slightly higher on smartphone addiction, neither difference was statistically significant, and the gender literature in this area is itself inconsistent with some studies documenting greater problematic use among men (González-Pinto et al., 2023; Korowat, 2023), others among women (Wong et al., 2022), while others found for gender to be a moderator but not a main effect (Song et al., 2024). Our results suggest a near-significant trend towards social anxiety that mirrors the epidemiological finding of higher rates in females suffering from anxiety disorders (Santomauro et al., 2021), though this difference may be diminished in a larger sample. The key takeaway of this finding is that smartphone addiction in urban Bangladesh is not generally gender-specific, and that any preventative work should therefore not be gender-focused (Ratan et al., 2022).

The family type produced the most apparent demographic result and directly relates to the fifth objective. Participants from extended families scored higher than participants from nuclear families on both social anxiety ($M = 34.20$ versus 29.32 ; $t = -2.324$, $p = 0.05$). Longer households have more possible evaluators and a more rigid seniority structure which leads to many more instances of feeling watched and judged as well as restricting freedom of opinion. This finding is in line with cognitive models where we see the already-prepared negative evaluation of an audience as being the proximate cause of social anxiety (Rapee & Heimberg, 1997). It is also consistent with longitudinal evidence that family dysfunction and parental phubbing are significant predictors of excessive smartphone use, as well as previous work in Bangladesh identifying larger household size to be a predictor of problematic use (Crowhurst & Hosseinzadeh, 2024; Ratan et al., 2022). This means that for these households the smartphone provides a mobile private space in which, as individuals find interactable on their own terms, which is the very compensatory function predicted by the theoretical framework (Kardefelt-Winther 2014). This finding is unique as the international literature on social anxiety and problematic smartphone use rarely studies family structure—and highlights the importance of probing established relationships using culturally distinct populations (Ratan et al., 2022).

Hierarchy on social anxiety was found significant with respect to socio-economic status, $F(2, 172) = 4.625$, $p = .05$, though the descriptive means were in a similar declining trend. The simplest answer, we think, is that the smartphone ownership and use with such frequency had come close to universal across economic strata in urban Bangladesh, so access does not differentiate groups even when the psychological vulnerability does (Ratan et al., 2022). This finding resonates with cross-national findings that problematic use is increasing everywhere and no longer restricted to high-income countries (Olson et al., 2022).

The association of social anxiety with either educational qualification or occupation was not statistically significant, $F(3, 171) = 1.531$ and $F(4, 170) = .398$ and $F(3, 171) = 1.287$ respectively, or with smartphone addiction (397), $F(4, 170) = 2.202$ and $F(342, 51) = .281$ respectively; Third : the correlation between self-confidence of staying strong to use a smartphone at sale prices cannot be neglected. Because educational attainment is an institutional credential, and does not intrinsically alter the internal cognitive mechanisms determining how people appraise their fear of negative evaluation, its lack of relationship with social anxiety should theoretically surprise no one (Leigh & Clark, 2018). Likewise, current smartphone interfaces do but require minimal specific mastery so that people of every educational level can access all apps which sustain the problematical use (Kuss & Griffiths, 2017). Nonetheless, we mention the descriptive pattern as secondary education was associated with higher means for both social anxiety and smartphone addiction, and occupational status revealed the highest mean score of smartphone addiction among unemployed participants. The two observations are consistent with earlier Bangladeshi evidence suggesting unemployment as a predictor of problematic use, while the lack of statistically significant association is probably due to small cell size in these subgroups rather than indicating true absence of effect (Ratan et al., 2022).

Theoretical and Practical Implications

More theoretically speaking, the findings impart clear support for both the compensatory account of problematic technology use and – by virtue of its design – for the person component of the Interaction profile afforded by Brand et al. (2019) and Kardefelt-Winther (2014). It is difficult to fit the correlation pattern among subscale scores into a purely technological model of smartphone addiction, as only relational and withdrawal dimensions could be predicted by a device affordances-based or usage-focused interpretation (Panova & Carbonell, 2018). The demonstration that the association generalized to an adult South Asian community sample also extends the external validity of a literature largely built upon East Asian and Western undergraduate student samples (Ran et al., 2022). In practice, this means that for socially anxious individuals simply restricting screen-time is unlikely to be effective on its own (Elhai et al., 2018), as study participants have been shown to respond negatively when the compensatory behavior is removed without any healthy way of responding to the fear underlying it. Thus, interventions that involve graded exposure to face-to-face interaction, cognitive restructuring of beliefs about negative evaluation and structured social skills practice are more effective in producing lasting change in problematic use (Leigh & Clark, 2018). It may be especially useful for family level work in the Bangladeshi context, where participants from extended households were at higher risk (Crowhurst & Hosseinzadeh, 2024).

LIMITATIONS

Several limitations qualify these conclusions. First, the cross-sectional design precludes causal inference, and the possibility of reciprocal influence is real, since problematic smartphone use may itself erode offline social competence and thereby increase social anxiety over time (Crowhurst & Hosseinzadeh, 2024). Second, the sample of 175 participants was drawn purposively from a single metropolitan area, so the findings may not generalize to rural Bangladesh or to the country as a whole, and several demographic cells, notably the upper socio-economic and unemployed groups, contained too few participants for robust subgroup comparison (Sayeed et al., 2021). Further study is required adopting probability cluster-sampling or multistage-sampling for greater generalization. Third, all measures were self-reported, which introduces the possibility of common method variance and social desirability bias, and objectively logged screen-time data were not available for validation (Olson et al., 2022). Some participants completed the questionnaires without direct supervision, which protected them from evaluative pressure but reduced control over the response context. Fourth, potential

mediators and confounders such as loneliness, rumination, depressive symptoms, sleep quality and daily usage duration were not measured, so the mechanisms through which social anxiety exerts its effect could not be modeled in this dataset (Zhou & Feng, 2025). Finally, future research is recommended controlling for potential confounders such as loneliness, rumination, depressive symptoms, sleep quality, and daily usage duration to isolate the unique contribution of social anxiety considering a clinical diagnostic assessment in future studies to validate the continuous measure of social interaction anxiety and examine whether findings hold for clinically diagnosed social anxiety disorder.

CONCLUSION

This research investigated if social interaction anxiety forecasts smartphone addiction in a sample of 175 persons from Dhaka city and whether these variables vary among different demographic groups. Social anxiety showed a substantial and positive correlation with overall smartphone addiction and with each of the six facets of problematic usage, serving as a notable predictor that explained roughly twenty-nine percent of the variance in smartphone addiction. The most significant correlations pertained to the withdrawal and digital relationship aspects, suggesting that socially anxious individuals transfer their interpersonal interactions to devices and feel unease when detached from them. The kind of family and socio-economic position influenced the degrees of social anxiety, with individuals from extended families and lower-income backgrounds exhibiting the most significant amounts, while family type also distinguished smartphone addiction. Gender, educational attainment, and profession exhibited no substantial correlation with either dimension. These findings collectively endorse compensating frameworks of problematic technology usage and illustrate that a correlation predominantly observed in Western and East Asian student populations is applicable within an urban South Asian adult demographic. The primary finding indicates that smartphone addiction among this demographic should be perceived not merely as a lack of self-regulation in solitude, but rather as a tactic for coping with social anxiety; hence, a successful intervention must tackle both the anxiety and the behavior.

RECOMMENDATIONS

Based on these results, other suggestions can be proposed. Mental health professionals ought to consistently assess for social anxiety in folks who express worries regarding excessive smartphone usage, since managing the conduct without tackling the fundamental interpersonal apprehension is improbable to yield enduring results (Leigh & Clark, 2018). Empirical psychological interventions for social anxiety, encompassing cognitive reframing of negative evaluative beliefs and incremental exposure response prevention therapy (ERP) to anxiety-inducing social contexts, ought to be available via university counseling centers, primary healthcare, and community clinics in Dhaka (Clark & Wells, 1995). Educational establishments and employers ought to establish organized, low-pressure avenues for in-person engagement, including small-group tasks, peer mentoring, and guided collaborative efforts, to facilitate the gradual restoration of offline confidence for socially anxious individuals (Song et al., 2024). Psychoeducation centered on families and social skills training are advised due to the heightened risk identified in individuals from larger households, prioritizing the minimization of critical assessment, fostering an environment for personal viewpoints, and exemplifying healthy technology usage among elder family members (Crowhurst & Hosseinzadeh, 2024). Public health officials ought to integrate digital wellbeing materials into current health promotion initiatives, encompassing actionable tactics like turning off non-essential notifications, creating device-free intervals, and safeguarding sleep, which have demonstrated efficacy in mitigating problematic usage in controlled studies (Olson et al., 2022). Due to the correlation between economic hardship and elevated social anxiety, outreach efforts ought to focus on low-income neighborhoods, where the demand for psychological support and obstacles to access are most pronounced (Ratan et al., 2022). Ultimately, it is imperative for researchers and policymakers in Bangladesh to allocate resources toward longitudinal monitoring of excessive smartphone usage to provide trend analysis and intervention assessment over time (Meng et al., 2022).

Conflict of Interest

The author asserts that there are no conflicts of interest pertaining to the research, authorship, or publishing of

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