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Prevalence and Relationship of Smartphone Addiction, Nomophobia, and Social Anxiety among College and University Late Adolescents

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Abstract
Objective: To examine the prevalence and relationship of smartphone addiction, nomophobia, and social anxiety.
Methodology: The study was carried out in two phases i.e., Translation and Tryout and Main Study. Survey research was conducted on the sample of college and university adolescents (*N* = 1050) which was approached using convenience sampling.
Results: Theregression analysis revealed that smartphone addiction is a significant predictor of social anxiety(β = .197, *p*< .001) and nomophobia (β = .58, *p*< .001).Findings showed that the prevalence of smartphone addiction was 13 % among male students and 13 % among female students whereas 15 % females and 11 % males were found to be higher on nomophobia. Besides this 15% males and 11%, females were high on social anxiety.
Conclusion: Smartphone addiction is a significant predictor of nomophobia and social anxiety. It is equally prevalent among males and females. Nomophobia was high in female students.Contrary to this social anxiety was high in males.

Keywords: Smartphone addiction, nomophobia, social anxiety,university students,prevalence, adolescents.

I. INTRODUCTION

Smartphone Addiction and its Relationship with Social Anxiety

Smartphone addiction (SPA) is defined as the recurring or casual motivation to continue to use one's cellphone again and again despite adverse effects on a person's health. One issue with an addiction is a reduction in strength of will because individuals feel pressured to execute an act even though that act might be harmful and dangerous (Roberts, Yaya,&Manolis, 2014).

Previous research discovered that those individuals who were using their mobile phones greatly (addicted to smartphones) were highly prone to health-related issues (e.g. headaches, tiredness, diminished attention, sleeplessness, nervousness, anxiety related to making social contacts, and listening issues) (Bianchi,& Phillips, 2005).

Prevalence of smartphone addiction. Various studies confirmed that dependence on mobile phones is between 18.5% and 48.9% (Dixit, Shukla, Bhagwat,Bindal, Goyal, Zaidi, Shrivastava,2010).The university students considered their livesmiserable without cellphoneSuch reliance on a smartphone is a clear-cut indication of SPA. Moreover, it was investigated in research that 60% of university students were ready to accept that they were suffering from SPA (Roberts, Yaya,&Manolis, 2014).

The users of smartphones want to use their phones for a great period to gratify themselves as well as they also develop a habit of compulsive checking (Oulasvirta, Rattenbury, Ma, &Raita, 2012). Such addictive behavior for mobile phones is responsible for giving birth to the word nomophobia (NMP), described as an unmanageable dread of going out of the house while not carrying a mobile phone. It might be regarded as one of the side effects related to the overuse of smartphones (Bragazzi,&Del-Puente,2014).

Nomophobia and its Relationship with Smartphone Addiction and Social Anxiety

NMP is defined as a no cellphone fear, the dread/nervousness of being not in touch with the cellphone, and is viewed as an ailment of a modern and digital society that is characterized by inconvenience, tension, nervousness, or sorrow brought about by being far from the cellphone. The word was given by the UK Post Office who especially made YouGov, a research associate of the UK that examined 2163 individuals to observe tensions experienced by cellphone users. The research gave results that about 53% of people who utilized cellphone become nervous when their mobile phone was misplaced, the battery was dead, the balance was finished or there was no net (Kanmani, Bhavani,Maragatham,2017).

Several features related to NMP and SPAare similar but the most important feature which is common in both disorders is that the smartphone is providing relief and ease to the victims of both disorders (Harkin,2003). NMP is also adversely influencing the social functioning of a person. An individual suffering from it may experience social issues (Bragazzi,&Del-Puente,2014). It is assumed that NMP can make individuals unsociable because nomophobic people rely on their phones for contacting others and doing friendships. They would not be able to make true companions in actuality due to their habit of doing friendships on social media through their smartphones (Razzaq,Samiha,&Anshari,2018).Nomophobiais generally prevalent in the public**.** Cross-sectional research done on students in India described that 18.5% of people were suffering from NMP (Dixit et al.,2010). Another study led in 2008 among cell phone abusers revealed that 53% of participants have NMP (Cheever, Rosen, Carrier, &Chavez,2014).Likewise,research on young people of Edirne and Izmir showed the incidence of such phobia higher than average (Gezgin, &Cakir, 2016).Overuse of smartphones may be harmful to the social life of an individual e.g. those people who use their smartphones too much (nomophobic) become socially isolated. They suffer from social withdrawal and social anxiety (Beranuy,Oberst,Carbonell,&Chamarro,2009).

Social anxiety (SA)is defined asnoticeable and constant dread in social conditions in which an individual is presented to unknown individuals or is examined by others (American Psychiatric Association, 2013).It is the most widely recognized anxiety disorder and the third most regular mental issue in people (Hofmann, &Bogels,2006).Social anxiety is a widespread disorder. The life span frequency of this disorder within teenagers typically varies from 2 to 9% (Gren-Landell,Tillfors,Furmark, Bohlin, Andersson,Svedin,2009). It is not confined to one country or continent but various researches carried out throughout the world suggest an active prevalence of SA among teenagers for instance in Turkeyit is 23% (Dilbaz,Cavus,&Darcin,2011).

In the current study following objective was formulated i.e.to check the prevalence and relationship of SPA, NMP, and SA among college and university adolescents.Hypotheses formulated in this research were:

H1. Smartphone addiction will positively predict nomophobia.
H2. Smartphone addiction will positively predict social anxiety.
H3. Nomophobia will positively predict social anxiety.

II. METHODOLOGY

Research Design

The target of the existing research was to explore the prevalence and relationship of SPA, NMP, and SA among college and university adolescents. Survey research was conducted for the collection of data.

Sample

The sample of the research consisted of college and university students (adolescents) (N = 1050). The sample was almost equally divided into girls (n = 574) and boys (n = 476). The sample age range was 17 to 30 years (M = 19.71, SD = 2.46). The samplewas approached using convenience sampling.

Instruments

Smartphone Addiction Scale–Short Version (SAS-SV). It is used to measure the SPA. It contains 6 aspects and 10 items. It is a six-point Likert scale (1: "strongly disagree", 2: "disagree", 3: "weakly disagree", 4: "weakly agree", 5: "agree", and 6: "strongly agree") It was concluded in another research that total score on the scale was the sum of scores on each item. The cut-off score of males was 31 and of females, it was 33. The people scoring greater than the cutoff score were believed to be at greater risk of SPA. The value of Cronbach's alpha for the questionnaire was .91 (Kwon,et al., 2013).[16]

Nomophobia Questionnaire (NMP-Q). This scale contained 20 items. It was developed by Yildirim and Correia (2015). The value of Cronbach's α for the scale was .94. It is a 7 pointLikert scale with seven responses from 1 to 7 where 1= strongly disagree and 7= strongly agree. It is for every NMP-Q item leading to a summated total score. The more the score, the more would be level of NMP. The explanation of NMP-Q score into the level of NMP (out of a total score between 20 and 140) is that if the score is equal to 20, it would indicate the absence of NMP; if the score ranges from 21 to 59, it would indicate a mild level; if the score is from 60 to 99, it will indicate a moderate level; and a score ≥100 would indicate a severe level of NMP (Yildirim,& Correia,2015).

The Leibowitz Social Anxiety Scale (LSAS). It was initially developed by Leibowitz (1987). It comprised of 24 items. The response format is 0 to 3. A high score on this scale shows high SA. The value of the coefficient of Cronbach's alpha for LSAS total score was found to be 0.96 Percentile ranks were computed to determine the prevalence of SA for the present study. Those with 75thor above percentile score were supposed to have severe SA.

Procedure

The study was conducted in two steps. Firstly the scales were translated in Urdu through a committee approach and psychometrics of scales were ensured by applying them on a small sample. For conducting the main study we used convenience sampling. The students (university and college) completed the informed consent form, demographic information questionnaire, and three other questionnaires used in the proposed study. After collecting data; suitable statistical analyses (e.g. t-test, correlation, and regression) were done for testing hypotheses. Feelings of gratitude were expressed towards the respondents for taking part in this research.

III. RESULTS

To accomplish the objectives of the study, various statistical analyses were conducted including reliability analysis, correlation, and regression.

Table 1

Means, Standard Deviations, Alpha Reliabilities, and Correlation Matrix for all Variables (N = 1050)

Variables	1	2	3	*M*	*SD*	*α*
1	--	.58***	.09**	84.67	22.91	.88
2	--	--	.18***	33.92	9.81	.77
3	--	--	--	55.20	10.16	.80

Note. 1 = nomophobia; 2 = smartphone addiction; 3 = social anxiety.

**p < .01. ***p < .001.

Table 1 shows Pearson correlation and psychometric properties of study variables. The findings indicate that NMP has significant positive correlation with SPA (r = .58, p < .001) and SA (r = .09, p< .01). SPA has significant positive correlation with SA (r = .18, p < .001). The reliability coefficient of NMP, SPA, and SA concern scale is .88, .77, and .80 respectively which indicates satisfactory internal consistency.

Table 2

Multiple Regression Analysis for Predicting Social Anxiety from Nomophobia and Smartphone Addiction (N =1050)

Model	Predictor Variable	*B*	*SE*	*β*	R^2	ΔR^2	*F (Model)*
1	(Constant)	51.69	1.20		.009	.008	9.20**
	Nomophobia	0.04	.01	.09**			
2	(Constant)	49.03	1.29				
	Nomophobia	-.009	.017	-.020	.035	.033	18.67***
	Smartphone addiction	.20	.04	.197***			

**p < .01. ***p < .001.

Regression analysis is computed with NMP and SPA as predictor variables and SA as the outcome variable. The ΔR^2 value of .008 for model 1 indicates that 0.8% variance in the SA can be accounted for, by the NMP with F (1, 1048) = 9.20, p< .01. The ΔR^2 value of .033 for model 2 indicates that 3.3% variance in the SA can be accounted for, by the NMP and SPA with F (2, 1047) = 18.67, p< .001. The findings indicate that in model 1 NMP (β = .09, p< .01) has a significant positive effect on SA among students whereas in model 2 NMP (β = -.02, p > .05) is a non-significant predictor of SA due to shared variance of NMP with SPA.

Table 3

Regression Analysis for Predicting Nomophobia from Smartphone Addiction (N= 1050)

	Nomophobia		
Variables	*β*	ΔR^2	*F*
Smartphone addiction	.58***	.33	517.06***

***p < .001.

Regression analysis is computed with SPA as the predictor variable and NMP as an outcome variable. The ΔR^2 value of .33 indicates that 33% variance in the dependent variable can be accounted for, by the predictors with F (1, 1049) = 517.06, p < .001. The findings indicate that SPA (β = .58, p < .001) has significant positive effect on NMP among students.

Table 4

Prevalence of Nomophobia, Smartphone Addiction and Social Anxiety among Participants on their Demographic Characteristics Based on their Percentile (N = 1050)

Note. NMP = nomophobia; SPA = smartphone addiction; SA = social anxiety.

Variables	Gender		Family		Education		
	(n =)	(n)	(n)	(n)	(n)	(n)	(n)
	Male	Female	Nuclear	Joint	Inter	BS	MPhil
SPA(%)	(137)13%	(138)13%	(164)16%	(111)11%	(103)10%	(171)16%	(1)0.9 %
NMP(%)	(117)11%	(157)15%	(161)15%	(113)11%	(84)8%	(188)18%	(2)0.19%
SA(%)	(159)15%	(114)11%	(156)15%	(117)11%	(104)10%	(164)16%	(5)0.5 %

Table 4 shows the prevalence of students on NMP, SPA, and SAconcerning different variables. Results revealed that 15 % of females and 11 % of males were found to be higher on NMP. The prevalence of SPA is 13 % among male students and 13 % among female students. The occurrence of 15% males and 11% females are rated onthe SA scale. Regarding the family system students of the nuclear family system (15 %) were higher on NMP as compared to students of the joint family system (11%).The prevalence of the nuclear family system (16%) is higher on SPA is recorded than the joint family system (11%). Students belonging to the nuclear family system in SA were higher (15%) as compared to students belonging to the joint family system (11%). At the Intermediate level, 10 % of students are higher on SA and SPA than NMP (8%). While at BS/MSc level 18 % of students were victims of SA than on SPA and SA (16%). While at MPhil level SA 0.5%, SPA 0.9% and NMP 0.19% were recorded.

IV. DISCUSSION

The research was conducted to discoverthe prevalence and relationship of SPA, NMP, and SA in college and university students (adolescents). The first hypothesis of the study was that SPA would positively predict NMP in college and university students and was accepted in the current study. When a person is too much attached tothe smartphone, he might suffer from some discomfort and anxiety when he would not be able to use his smartphone and show some nomophobic behaviors i.e. fear of being not in contact with the smartphone. Some other researches also indicated similar results. Research done on a sample of students concluded that there is a link between SPA and NMP. Both NMP and SPA have similar symptoms and are related to smartphone abuse (Durak,2018).

It was also hypothesized that SPA would positively predict SA in college and university undergraduates. The outcomes of this research discovered that SPA is a predictor of SA. Smartphones have a lot of uses but they can be injurious for the physical and mental health of people if they are misused. A person who is addicted to smartphones would also have fear of public situations i.e. he might be suffering from SA. Similarly, an earlier study also showed a connection between social isolation and SPA in the sample of undergraduates (Enez-Darcin,et al., 2016).

It was hypothesized that NMP would predict SA in college and university students. Results of this study indicated that NMP is not a predictor of SA. Model 1 ofTable 3 depicts that NMP predicts SA but in model 2 due to shared variance of NMP with SPA turns NMP to be non-significant whereas SPA was significant. As the research is carried out in such a city where people have less awareness about their excessive use of smartphones so, they lack insight into having NMP. An earlier study also discovered that culture has a significant role in using technology (Sironi,Türetken,Lepetit,&Fua, 2015).Pakistan has a collectivistic culture in which people support each other and are interdependent. That is why it may be a cause that NMP does not predict social withdrawal.

The prevalence of SPA was explored during this study. The prevalence of SPA was 13 % in male students and 13 % in female students based on percentile. The prevalence of SPA is increasing in people because young, as well as the older generation, have become so much dependent on their smartphones for their completion of daily life activities such as interacting with people, remembering their routine life tasks, and setting alarms for waking in the morning, etc. Previous literature showed similar findings. According to an earlier study conducted on the young people of Europe discovered a 16.9% prevalence of SPA (Haug,et al., 2015).

NMP prevalence was also identified in the current research. Results of this research based on percentile revealed that 15 % females and 11 % males were found to be higher on NMP. The prevalence of NMP is also increasing in the population over time due to the advancement in technology. In this modern era of technology, everyone possesses a smartphone. Nowadays people cannot imagine going out of the home without having a smartphone even people inside their homes also try to keep their smartphones with themselves. Some researches conducted in the past also demonstrated results that resemble some extent to outcomes of the current study that NMP is increasing among people. Research in India revealed that 73% of

individuals have NMP and 83% of them told that they had panic attacks when they could not get their smartphones (Sharma,et al., 2015).

The prevalence of SA among college and university students was also identified in this study. Findings showed that on basis of percentile 15% males and 11% females were high on SA. Prevalence of SA is increasing progressively in the teenagers. It is more common in males than females. There may be different causes of SA for example nowadays young people and teenagers are continuously using social media through their smartphones. Results of studies done in the past also revealed similar findings. The majority of the individuals (63.9%) in the earlier research showed some level of SA. This conclusion is similar to another research also done on the sample of medical college students. The research concluded that the prevalence of SA was (60%) and the level of SA was high in males than females (Elhadad,et al., 2017).

V. CONCLUSION

It was concluded in the target research that SA could cause NMP and SA. People addicted to smartphones would also have NMP and are also highly susceptible to SA. Besides this significant gender differences were found on SA only.The prevalence of NMP was high in female students whereas SA was high in males.

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