

Smartphone addiction and its associated factors among students in twin cities of Pakistan

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Abstract

Objective: To determine the prevalence and indicators of smartphone addiction in local population.

Method: The cross-sectional study was conducted in the twin cities of Islamabad and Rawalpindi, Pakistan, from August 2017 to August 2018, and comprised school, college and university students of either gender aged 12-19 years. Data was collected using Smartphone Addiction Scale-Short Version with a cut-off score of 31 for boys and 33 for girls. Data was analysed using SPSS 23.

Results: Of the 702 subjects screened, 422(60%) had smartphone addiction; 242(57.3%) males and 180(42.6%) females. Social networking applications were significant indicators of the addiction ($p < 0.05$).

Conclusion: Smartphone addiction was found to be high among Pakistani adolescents.

Keywords: Smartphone addiction, Prevalence, Risk factors, Adolescents. (JPMA 70: 1357; 2020).

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Introduction

Smartphone usage has become a common and essential part of people's life in recent years. In 2016, 2.1 billion individuals were found to be registered smartphone users in the world.¹ The common usage of smartphone has generated many terms like "smartphone addiction", "problematic smartphone usage" and "mobile phone addiction". Such variations in conceptualisation of unhealthy usage of smartphone have given rise to controversies regarding the appropriate application of the term "addiction".² Although, the research on problematic usage of smartphone is still in its infancy stage and smartphone addiction is not part of any classification system for diagnosis, there is considerable evidence indicating "problematic smartphone usage" as a form of behavioural addiction. Smartphone addiction is widely defined as a behavioural addiction encompassing four components: compulsive usage of smartphone, tolerance (an individual's diminished response to an addictive substance / stimuli due to recurrent use), withdrawal and functional impairment.³ Therefore, it is considered similar to the diagnostic criteria of internet addiction as defined in the Diagnostic and Statistical Manual (DSM-V).^{4,5}

In the past five years, more than 2000 empirical studies have investigated smartphone addiction. Majority of the

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studies investigated smartphone addiction in order to develop self-reporting inventories, determining the prevalence rate and its correlates.⁶ Recent research has documented different patterns of prevalence of smartphone addiction throughout the world. For instance, smartphone addiction rates in European countries, like Switzerland, Spain, France and the United Kingdom were 16.90%, 12.50%, 21.59% and 10% respectively.⁷⁻⁹ In contrast, smartphone addiction rates in the Middle East and Asian countries, like Saudi Arabia, India and South Korea, were 48%, 55.70% and 35.20% respectively.¹⁰⁻¹² Although, findings do not represent the generalised estimates due to methodological limitations, like non-random sample selection and usage of different instruments, these studies provide considerable evidence regarding the high rates of smartphone addiction. Besides, the high rates of smartphone addiction have promoted a substantial amount of research regarding the correlates of smartphone addiction with clinical and psycho-social factors.

Studies have highlighted the negative psycho-social and physical effects of smartphone addiction. Internet usage through smartphone has been said to cause problematic behaviours, such as violence, influenced by game-playing and cyber-bullying through social network services (SNSs), and the internet was also considered an easily accessible source of pornography for adolescents. In addition to it, the irrational and excessive use of smartphone has been

associated with symptoms of depression, anxiety, insomnia¹³⁻¹⁵ and poor academic performance.^{13,16} Smartphone addiction is observed across all age groups and other socio-demographic classes, but it is more prevalent among adolescents and females.¹⁷ Similarly, the usage, indicators and patterns of smartphone usage are different across diverse cultural and ethnic settings.¹⁸ Therefore, it is pertinent to investigate the predictors or indicators of smartphone addiction within the cultural context. In the past few years, Pakistan has undergone repetitive episodes of economic instability, low literacy rate and organised violence.¹⁹ In this regard, mental health issues in general and addiction in particular have gained special interest. Although, many surveys and studies have demonstrated the prevalence and risk factors of chemical addiction in Pakistan²⁰ but there is paucity of empirical studies indicating the rates and predictors of non-chemical addictions.

The current study was planned to determine the prevalence and indicators of smartphone addiction in the local population.

Subjects and Methods

The cross-sectional study was conducted in the twin cities of Islamabad and Rawalpindi, Pakistan, from August 2017 to August 2018, and comprised school, college and university students of either gender aged 12-19 years. After approval from the ethics review board of International Islamic University (IIU), Islamabad, the sample size was worked out. Literature²¹ has suggested a sample size of 180 to achieve 80% statistical power in order to detect the effect size ranging from medium to large cohorts in a model containing five predictors. However, we targeted a much larger sample size. Using purposive convenient sampling technique, the sample was raised from among students who were capable of responding to the research question enrolled with different schools, colleges and universities of the twin cities, including IIU, Iqra College of Technical Education, Islamabad, United Chenab School and College, Islamabad, Bahria University, Islamabad, and Government Gordon College, Rawalpindi.

1. Those diagnosed with psychiatric / psychological disorders as per the International Classification of Diseases (ICD-10) or DSM-V criteria but due to general medical condition or substance misuse, dementia, delirium, alcohol or drug dependence, schizophrenia, bipolar disorder, intellectual /

learning disability were excluded and so were those who were unable to respond to the research question or unwilling to provide informed consent.

After getting informed consent from the subjects, data was gathered using Smartphone Addiction Scale-Short Version (SAS-SV), which is a revised and short version of the Smartphone Addiction Scale.²² It is developed to provide cut-off values by gender in order to determine smartphone addiction. It consists of 10 items, and individuals have to respond on a Likert scale between 1-6, where 1 indicates 'strongly disagree' and 6 indicates 'strongly agree'. The internal consistency of this scale was found to be $\alpha=0.91$. The cut-off score for boys is 31 and for girls it is 33, and it has demonstrated good sensitivity and specificity for the given cut-off scores.²²

Socioeconomic status refers to the social class or standing of an individual in society. In the present study it was measured by using single statement, "I belong to one of the following socioeconomic status". The respondents could choose one of the three classes: higher, lower and middle.

Data was analysed using SPSS 23. Descriptive statistics were used to explore the prevalence of smartphone addiction among students along with other sociodemographic characteristics. To assess the difference based on gender and family system in terms of smartphone addiction, independent sample t-test was used. Analysis of variance (ANOVA) was used to assess the difference based on educational level, socioeconomic status and time spent in terms of hours per day with smartphones. After attaining significant results by ANOVA, further analyses were carried out using post-hoc Hochberg GT2 to explore the difference in details.

Results

Of the 748 forms distributed, 702(%) were received fully completed. Among them, smartphone addiction was noted in 422(60%) subjects; 242(57.3%) males and 180(42.6%) females. The prevalence rate in female was higher compared to males; most were from middle socioeconomic status; living in nuclear family system; having graduate level of education; and spending 8-9 hours with their smartphones (Table 1).

Individuals using Facebook, Instagram and WhatsApp were at increased risk for smartphone addiction (Table 2). The intensity of smartphone addiction was significantly

Table-1: Smartphone (Sp) Addiction Characteristics (n = 702).

Variables	n (%)
Total Participants	702 (100)
Above Cutoff Score	422 (60.1)
Below Cutoff Score	280 (39.9)
Prevalence Rate (Female)	
Below Cutoff (SAS Score < 31)	86 (32.3)
Above Cutoff (SAS Score ≥ 31)	180 (67.7)
Prevalence Rate (Male)	
Below Cutoff (SAS Score < 33)	194 (44.5)
Above Cutoff (SAS Score ≥ 33)	242 (55.5)
Time Spent (Hours/Day)	
2-4 hours	85 (20.1)
5-7 hours	132 (31.3)
8-9 hours	169 (40.1)
10-12 hours	36 (8.5)
Sociodemographic Characteristics of SP-Addicted (n = 422)	
Gender	
Male	242 (62.1)
Female	180 (37.9)
Socioeconomic Status	
Lower	60 (14.1)
Middle	291 (68.9)
Upper	71 (16.0)
Family System	
Nuclear	287 (68.0)
Joint	135 (38.0)
Education	
Middle	15 (5.6)
Matric	33 (7.8)
Intermediate	120 (28.4)
Graduate	254 (60.2)
Age	
13-16 years	66 (15.6)
17-19 years	356 (84.4)

higher in females ($p < 0.001$) and among those living in nuclear family system ($p < 0.01$) (Table 3).

Smartphone addiction was also significantly different in terms of education, time spent and socioeconomic status ($p < 0.01$). Individuals who had matric level of education were more addictive than those who had above or below matric level of education, but the difference between under-matric and matric groups was not statistically significant ($p > 0.05$). Addiction intensity was significantly

Table-2: Types of Social Media Usage among Addicts (n= 422).

Types of Social Media Used	n (%)	χ^2	p-value
Facebook		406.15	<.001
Yes	418 (99.1)		
No	04 (0.9)		
Twitter		7.97	.005
Yes	182 (43.1)		
No	240 (56.9)		
Instagram		37.62	<.001
Yes	274 (64.9)		
No	148 (35.1)		
Viber		233.64	<.001
Yes	54 (12.8)		
No	368 (87.2)		
Tango		342.18	<.001
Yes	21 (05.0)		
No	401 (95.0)		
Chat on		367.86	<.001
Yes	14 (03.3)		
No	408 (96.7)		
Imo		92.90	<.001
Yes	112 (26.5)		
No	310 (73.5)		
WhatsApp		152.89	<.001
Yes	338 (80.1)		
No	84 (19.9)		

higher in individuals who were from upper and middle socioeconomic classes ($p < 0.01$). The difference between upper and middle socioeconomic classes was not statistically significant ($p > 0.05$).

Addiction was significantly higher in individuals who were using smartphone for 10-12 hours followed by 8-9 hours, 5-7 hours and 2-4 hours. The difference between those using smartphone 10-12 hours and individuals using 8-9 hours was not statistically significant ($p > 0.05$) (Table 4).

Discussion

The present study provides first insights into smartphone usage, prevalence of smartphone addiction and risk factors associated with it through a large sample of adolescents from the twin cities of Rawalpindi and Islamabad. The prevalence of addiction was found to be 60.10% which is

Table-3: Mean Difference on the bases of Gender and Family System in terms of Smartphone Addiction (n = 422).

Variable	Gender		t (420)	p-value	95% CI		Cohen's d
	Male (n = 242)	Female (n = 180)			LL	UL	
Smartphone Addiction	Mean ± SD	Mean ± SD	-12.4	<.001	-33.6	-24.4	1.2
	Nuclear (n = 287)	Joint (n = 135)	3.3	0.001	3.8	15.0	0.4

CI: Confidence interval

Table-4: Difference on the bases of education.

Variables	Df	F	η^2	Post-hoc (Hochberg GT2)	
Smartphone Addiction	3, 418	29.0***	0.21	Education Group Middle (M=138.8; SD=29.5)	Education Group < Matric (M= 148.6; SD=18.1) > Intermediate (M=129.8; SD=24.4) > Intermediate (M=112.9; SD=26.1)** > Intermediate (M=129.8; SD=24.4)** > Graduate (M=112.9; SD=26.1)*** > Graduate (M=112.9; SD=26.1)***
Difference on the bases of Time Spent (Hours per Day)					
	3, 418	47.9***	0.34	Time Spent (Hours per Day) 2-4 hours (M=95.8; SD=26.1)	Time Spent (Hours per Day) < 5-7 hours (M=121.0; SD=22.5)*** < 8-9 hours (M=130.9; SD=24.35)*** < 10-12 hours (M=139.0; SD=21.7)***
				5-7 hours (M=121.0; SD=22.5)	< 8-9 hours (M=130.9; SD=24.3)*** < 10-12 hours (M=139.0; SD=21.7)**
				8-9 hours (M=130.9; SD=24.3)	< 10-12 hours (M=139.0; SD=21.7)
Difference on the bases of Socioeconomic Status					
	2, 418	21.6***	0.10	Socioeconomic Class Lower (M=101.4; SD=20.4)	Socioeconomic Class < Middle (M=123.3; SD=26.0)*** < Upper (M=130.4; SD=31.9)***
				Middle (M=123.3; SD=26.0)	< Upper (M=130.4; SD=31.9)

*=p<.05; **p<.01; ***p<.001; M: Mean; SD: Standard deviation.

high compared to the rates identified in Western or European countries, and some other Asian countries, including the neighbouring Iran and India.¹¹ There are several putative reasons for such findings. The probable social and economic factors, including recent surge in organised violence, economic instability, low literacy rate and lack of awareness regarding healthy usage of digital devices can have some influence.¹⁹ Similarly, the cost of smartphone in Pakistan has decreased by 39% over the last 10 years, with often free accessibility to internet on smartphone now available, allowing access to a range of entertainment and other applications.²³ Moreover, findings indicated that the usage of Facebook, Instagram and WhatsApp were strong predictors of smartphone addiction.

Further, females reported higher prevalence. Gender differences in smartphone addiction have been reported inconsistently by studies, with only a few studies indicating male predominance.¹⁰ However, majority of studies have indicated females as being more vulnerable to smartphone addiction.¹⁷ In general, one putative reason is that females utilise mobile phones for the purpose of communication and social ties, while men tend to use the mobile phone for the sake of practical purposes, such as information seeking. The findings imply that women and men have differences in the level of dependence on

smartphones for developing and maintaining social ties. However, such findings can be extended and explained in terms of cultural and social context dominant in Asian countries, like Pakistan. In Asian Pakistani cultural context, the opportunities for females to have real-life interaction are limited compared to males.²⁴ This probable assumption further supports the idea that females are more prone to excessive use of smartphones for interaction and relationship-building purposes. Furthermore, the findings suggest that smartphone addiction is more common among nuclear family system that, by its very nature, promotes agentic and individualistic values. Such values probably mitigate real-life interaction within family. Similarly, data suggested that students enrolled in matric / secondary schools were at increased rate of smartphone addiction. Students enrolled in secondary schools mostly belong to early adolescence age group. Adolescents tend to be more preoccupied with their smartphones and are more passionate about the latest activities, apps and devices. The increased vulnerability of smartphone addiction among adolescents may be due to several factors, including a search for emotional relationships through different apps, desire to have more free time, keep up with fashion, and interest in entertainment apps and games. For these reasons, adolescents use smartphones for long hours. These findings are consistent

with studies reporting that adolescents are more prone to smartphone addiction.¹⁰ Data also revealed that smartphone addiction was more common among individuals from the upper and middle socio-economic classes compared to lower socio economic status. This finding concurs with studies indicating that students are more dependent on smartphones due to higher income, their parents or families allow them to spend more money and time on cell phones.²⁵ However, this finding is inconsistent with studies indicating that smartphone addiction was more common among individuals with low income and socioeconomic status, because it serves as a means to escape from their financial problems.¹⁰

Data revealed significantly high scores on smartphone addiction for participants who used smartphones >5 hours a day compared to individuals who used smartphones <5 hours a day. It indicates that the increased usage of smartphone is associated with increased risk of developing smartphone addiction symptoms. Overuse can promote habitual use, indicating that overuse is the strongest indicator of smartphone addiction. Several other studies reported that individuals using smartphones for longer time periods were more likely to be smartphone addicts.²⁶

The findings might draw attention of health professionals to provide their input in order to ameliorate the situation. Mental health professionals, including psychiatrists and psychologists, may prepare themselves in terms of preventing, diagnosing and treating smartphone addiction. Future studies shall focus on developing intervention plans in the form of counselling, parental training and psychotherapy related to smartphone addiction.

Conclusion

Smartphone addiction was found to be high among Pakistani adolescents. The phenomenon needs to be fully understood so that stronger and richer conclusions can be drawn regarding the burden of disease and the aetiology of this addictive behaviour that is increasing day by day in society.

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