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An assessment of smartphone addiction among adolescents in relation to their mental health and self-control

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Abstract
Individuals' mental health was negatively impacted by their confinement during COVID-19. Mental health is the "psychological condition of a person working at a satisfactory level of behavioral and emotional adjustment." As adolescents grow and mature, they frequently encounter a variety of emotional conflicts. Short episodes of depression also happen to occur, which are temporary. During this phase, the individual also encounters difficulties with self-control, social assimilation, academic performance, family life, and interpersonal and community relationships. This study was conducted to know the relationship between self-control and the mental health of Smartphone addicted adolescents. Using the Smartphone Addiction Scale, Mental Health Scale, and Self-Control Scale, the researcher collected data from a sample of 150 ninth-grade students using the Smartphone Addiction Scale, Mental Health Scale, and Self-Control Scale. By qualitatively analyzing the data, the study reveals a negative and statistically significant relationship between the variables that may aid in raising awareness of the negative impact of smartphone addiction among adolescents, parents, teachers, social workers, planners, managers, and policymakers in the fields of education and psychology

Keywords: smartphone addiction, mental health, self-control, adolescents

Introduction
Smartphones are tiny, portable electronic devices that can be operated online and contain a number of useful features and applications (email, social media, web browser, etc.). Researchers have observed an increase in the number of smartphone users embedded within mobile phones. Google reported 2 billion active users in 2017; this number increased to 2.5 billion in 2019 (Google I/O 2019). In 2019, Apple reported 900 million active users (Maestri, L., 2019) [15]. Google and Apple announced in 2019 that 3,4 billion people use smartphones manufactured by either company. These statistics exclude individuals who do not utilise Apple or Google products. Over dependency on smartphone is a form of addiction. It is analogous to internet addiction in general.

Smartphone Addiction
Compulsive behaviours, tolerance, withdrawal, and functional impairment are the four main elements of smartphone addiction (Block, J. J., 2008) [6]. A survey of 2,367 university students in Riyadh revealed that 27.2% of respondents claimed to use their smartphones for more than 8 hours per day (Alosaimi, F. *et al*., 2016) [2]. In a distinct study involving 688 university students in Lebanon (Boumosleh, J. M. *et al*., 2017) [7], 49 percent admitted to using their devices excessively (5 hours per weekday).

Self-control
In addition to smartphone obsession, self-control is one of several factors that affect smartphone usage. Self-control is a person's tendency to consider the potential consequences of their actions (Wolfe & Higgins, 2008) [25]. (Billieux, Van der Linden, & Rochat, 2008; Mumtaz, 2019) [4, 5, 17] It has been suggested that individuals who grapple with self-control cannot regulate their smartphone usage. In addition, a lack of self-control may make it difficult to focus on tasks, result in more irrelevant thoughts, and increase smartphone usage (Rochat, L, 2008) [4, 5]. In a perfect world, each individual is able to exercise self-control in accordance with social norms, allowing them to exercise self-control when using a smartphone (Parker & Jarolimek, 1993) [21]. Several earlier studies (Mumtaz, 2019) [17] determined that self-control contributed 2.2% to phubbing behaviour. Similar findings were found in other studies, which demonstrated that self-control only accounted for 26,1 percent of the variance in phubbing behaviour and that other factors accounted for the remaining 74.9 percent (Kurnia, 2020) [14].

Mental Health
Over use of smartphone was still associated with lower Subjective Happiness and mental health scores among respondents without anxiety and depression. PSU was associated with anxiety, depression, and mental disorders. Problematic smartphone use may adversely affect mental health regardless of anxiety or depression. (Ningyuan Guo *et al*, 2020). According to Billieux *et al*. (2008) [4, 5], addiction is characterised by an exceedingly strong dependence on a particular substance or activity that leads to recurrent engagement in behaviours with negative consequences. The notion that smartphone addiction negatively affects the mental health of college students is substantiated by prior research. According to a study, the distress of undergraduate college students was significantly correlated with the number of minutes per day they spent using their smartphones.

Significance of the research

Aligarh was chosen as the study area because it was easy to contain high school students aged 14 to 18 years old. The majority of secondary school students are adolescents, and research has shown that they undergo many significant psychological, mental, and physical changes and face numerous personal, psychological, and educational challenges. Currently, a smartphone facilitates learning by facilitating the management of diverse students in the classroom and the resolution of various student problems. Nevertheless, it also has negative effects, such as smartphone applications that divert you from your work, lack of concentration, and time wasted. It affects the mental health of students who use their smartphones excessively for education, entertainment, or communication. Even they are required to perform non-teaching duties in institutions. This may result in mental health issues and other psychological distresses. Multiple surveys have shown that all high school pupils own smartphones and utilise them frequently at home and in school. Researchers classify and designate smartphone addiction as "nomophobia" because excessive use of any electronic device, including smartphones, can lead to addiction.

In addition, they are spending an excessive amount of time in front of screens and becoming addicted or ensnared. Smartphone addicts frequently experience critical situations such as tension, insomnia, emotional balance, depression, virtual relationships, and introvert behaviours.

In this regard, the researcher is curious as to whether psychological factors such as mental health and self-control impact adolescents' smartphone addiction. This study's objective is to investigate the relationship between smartphone addiction and adolescents' mental health and self-control. In accordance with this objective, the following research questions will be investigated

Objectives

1. Is there any relation between smartphone addiction, mental health and self-control among adolescents
2. Is there any effect of gender on smartphone addiction among adolescents

Hypotheses

Ho1: There exists no significant correlation between smartphone addiction, mental health and self-control among adolescents.

Ho2: There exists no effect of gender on smartphone addiction among adolescents.

Methodology

In the present study, smartphone addiction served as the predictive variable, while mental health and self-control served as the dependent variable or criterion variable. The researcher employs a quantitative methodology and correlation and chi-square tests to evaluate the results.

Population of the study

From October to November 2021, the researcher herself conducted a survey in Aligarh. The study comprises 150 ninth-grade students between the ages of 14 and 18 who agreed to participate. The participants filled out self-reported questionnaires regarding smartphone addiction, mental health, self-control, and gender. Pearson's correlation and the chi-square test were used.

The sample of the study

According to Best and Kahn (2016), one can derive certain conclusions about the characteristics of the population from which the sample was drawn by witnessing the characteristics of the sample. Changes observed in the sample can also be extrapolated to changes that presumably occurred in the population. The researcher drew the sample for the current study from the Aligarh district in Uttar Pradesh. The researcher drew a total of 150 samples from secondary school students, 76 of which were male and 74 of which were female.

Table 1: Sample Distribution of Adolescents

Total	Male	Female
150	76	74

Tools

This study collected data primarily using the Smartphone Addiction Scale, the Self-control Scale, and the Mental Health Scale. The enumerations are as follows:

Smartphone addiction scale

A questionnaire developed by Dr Vijayshri and Dr Masaud Ansari Bihar, was used to assess different level of smartphone addiction among students, the age range is 14 to 24 years. This scale is a five point Likert scale these points are as follows: Strongly agree, Agree, Undecided, Disagree, and Strongly Disagree. The concept validity and criteria related validity of this scale were met. Higher score denotes greater smartphone addiction in this scale.

Self-control scale

It is developed by Arun Kumar Singh, Alpana Sen Gupta Patna (Bihar). It has been developed for the age group 10 to 15 years. The test is based upon following three important dimensions of self-control: Degree and adequacy of self-regulation, Freedom from impulsivity, Freedom from self-centeredness. Higher ratings reflect better self-control.

Mental health scale

This questionnaire is created by Dr Sushma Talesara and Dr Akhtar Bano Udaipur Rajasthan, the age range is 14 to 20 years. Following areas were included: school related causes, home related causes, peer group related causes. This scale is based on five point Likert scale method.

Interpretation and Analysis of Findings

Objective 1: Is there any relation between smartphone addiction, mental health and self-control among adolescents

Ho1: There exists no significant correlation between smartphone addiction, mental health and self-control among adolescents.

Table 2: Correlation between Mental Health and Smartphone Addicted among Adolescents

Independent Variable	Dependent Variable- mental Health		
	Total sample	Male	Female
Smartphone Addiction	-0.460**	-0.409**	-0.498**

** Correlation is significant at the 0.01 level (2-tailed)

The correlation between the interdependent variable and the dependent variable was represented graphically in Table 2. It indicates the magnitude and direction of the correlation between the variables, namely that it is significant and negative. The table demonstrates that the dependent variable of the study, smartphone addiction, has a negative correlation with the independent variable, mental health, for the entire sample of adolescents. Furthermore, both variables (mental health and smartphone addiction) are significantly correlated with each other at the 0.01 level. The null hypothesis Ho1 is therefore rejected based on the produced value of the correlation coefficient. In addition, the researcher interpreted the results of objective 1 as meaning that any change in the level of the independent variable can result in a change in the dependent variable. If adolescent smartphone addiction increases, adolescent mental health will decline across the sample as a whole, and vice versa. The measured value of the smartphone addiction and mental health correlation coefficient is -0.460**. If an adolescent has a high level of smartphone addiction, he or she is likely to have poor mental health in school, among peers, and within the family. The researcher also attempted to determine the categorical relationship between the variables of the study for male and female adolescents. A nearly equal number of male and female adolescents were selected as the study's sample. Table-2 demonstrates a significant negative correlation between smartphone addiction and the mental health of the male sample. At the 0.01 level of significance, the measured coefficient correlation between these two variables is -0.409**, which is considered weaker but still significant. For the female adolescents in the sample, both the magnitude and significance of the correlation were very high and significant, i.e. -0.498**, indicating a negative relationship. The significance level of this value is 0.01. Therefore, the mental health of both male and female adolescents will decline if their smartphone addiction increases.

Table 3: Correlation between Self-Control and Smartphone Addiction among Adolescents

Independent Variable	Dependent Variable- Self Control		
	Total sample	Male	Female
Smartphone Addiction	-0.442**	-0.481**	-0.417**

** Correlation is significant at the 0.01 level (2-tailed)

The correlation among the independent variable and dependent variable is displayed graphically in Table 3. It indicates the magnitude and direction of the correlation between the variables, namely that it is significant and negative. The table demonstrates that the dependent variable of the study, smartphone addiction, has a negative correlation with the independent variable, self-control, for the entire sample of adolescents. Furthermore, both variables (self-control and smartphone addiction) are significantly correlated with each other at the 0.01 level. The null hypothesis Ho1 is therefore rejected based on the produced value of the correlation coefficient. In addition, the researcher interpreted the results of objective 1 as meaning that any modification in the level of the independent variable can result in a change in the dependent variable. If adolescent smartphone addiction increases, the degree of self-control will decrease among the entire sample of adolescents, and vice versa. The correlation between self-control and smartphone addiction has been measured to be -0.442**. The researcher also attempted to determine the categorical relationship between the variables of the study for male and female adolescents. A nearly equal number of male and female adolescents were selected as the study's sample. According to Table 3, there is a significant negative correlation between smartphone addiction and masculine sample self-control. The measured correlation coefficient between these two variables is -0.481**, which is considered to be extremely high. This value is significant at a significance level of 0.01. For female adolescents, the correlation was weaker but still significant, with a value of -0.417**, indicating a negative relationship. The significance level of this value is 0.01. Therefore, regardless of gender; adolescents' self-control will decrease if their smartphone addiction increases.

Objective 2: Is there any effect of gender on smartphone addiction among adolescents

Ho2: There exists no effect of gender on smartphone addiction among adolescents.

Table 4: Effect of Gender on Smartphone Addiction among Adolescents

		Gender				Total Count	Percentage of Total Sample
		Count	%Male	Count	% Female		
Smartphone Addiction	very high level of addiction	12	8%	10	6.7%	22	14.7%
	high level of addiction	18	12%	6	4%	24	16%
	above average level of addiction	37	24.7%	40	24.7%	77	51.4%
	average level of addiction	6	4%	10	6.7%	16	10.7%
	below average level of addiction	3	2%	6	4%	9	6%
	low level of addiction	0	0%	2	1.3%	2	1.3%
Total		76	50.7%	74	49.3%	150	100%

From the above table, the results drawn show that 51.4% of the total sample majorly covers the subjects whose addiction level was above average. After which, the 16% comes to be a major part of the total percent covering the high level of smartphone addiction and least part of the total sample i.e. 1.3% belong to the low level of addiction. Both male and female are reporting to have (24.7%) above average level of smartphone addiction. In addition, 12% of males and 4% females report under the high level of addiction and 8% males and 6.7% females reported very high level of smartphone addiction and are the only ones under this level. Least percent of all the subjects under smartphone addiction is of the low level of addiction i.e. 0% male and 2% females.

To determine the effect of gender on smartphone addiction among Adolescents, the chi-square test was opted. No significant effect was found (2(4) =5.622, p>0.05). The calculated value of chi-square is 5.622, the degree of freedom is 4, the p- value is 0.359>0.05. Therefore, it implies the acceptance of the null hypothesis (Ho) and it can be inferred from the chi-square figures that there exists no significant effect of gender on smartphone addiction among adolescents.

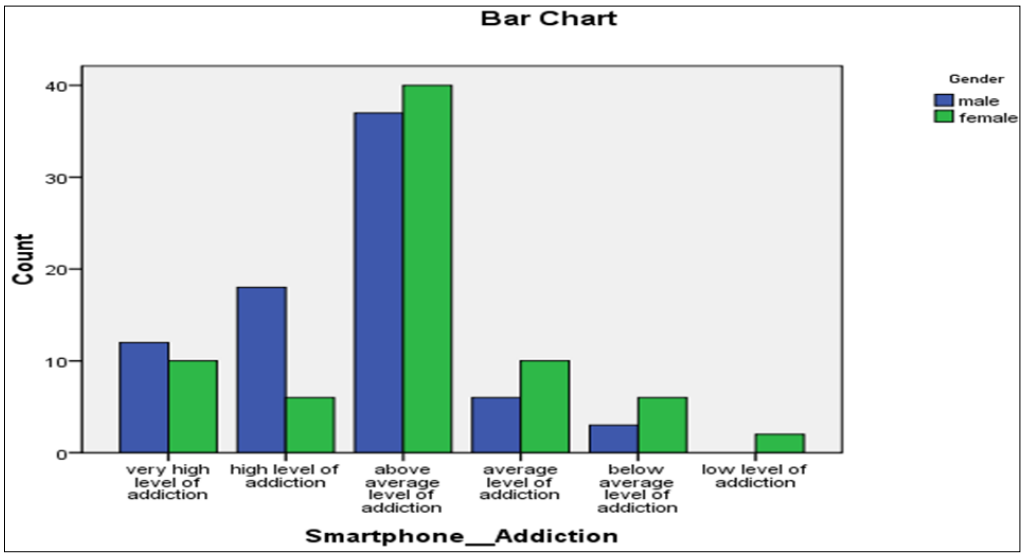

Fig 1: Effect of gender on smartphone addiction among adolescents

Results and discussion

The results and findings of the study indicate that the independent variable, namely smartphone addiction, has a highly significant relationship with adolescents' mental health and self-control. In the present day, teenagers in Aligarh were hooked up to their smartphones mainly because of the COVID 19 pandemic and later on get engage in a variety of activities, including e-learning, virtual classes, virtual relationships, social media, communications, online purchasing, meal orders, payments, and entertainment, among others. In this context, the study investigated whether smartphones have a significant impact on the mental health and self-control of male and female adolescents. The relationship between mental health and self-control and the independent variable, smartphone addiction, is inverse. The researcher concluded that if adolescent smartphone addiction is severe, their mental health and self-control will be substantially impaired, and vice versa. It refers to adolescents who are aware of themselves, their weaknesses and strengths, can think rationally even in different situations, have patience, and good decision-making skills, can easily change their habits and use opportunities to correct themselves, have a positive outlook on life, has self-control, believe in moral values, act in accordance with social and constitutional norms, are goal-oriented, and maintain healthy relationships with friends and family.

Strategies to cope up with smartphone addiction

1. Prioritize early evaluation, intervention, and treatment for adolescents with modest to moderate levels of smartphone addiction.
2. Parents should devote quality time with their kids.
3. Recognize the circumstances that lead you to take up the phone.
4. In-person interactions should give preferences instead of online interaction.
5. Instead of using your smartphone, engage in a healthful activity.
6. Do not slumber with your mobile device.
7. As healthful methods of relaxation, encourage them to engage in reading, engage to music, and cultivate new skills and interests.
8. Change the cellphone's settings

- Turn off notifications.
- The screen should be set to black and white.
- Delete anything is keeping you from returning to your home screen.
- You should extend your password.
- Switch your mobile device to airplane mode.
- A "do not disturb" setting should be activated.

Conclusion

While there have been a number of publications published in recent years exploring the causes and effects of adolescent and young adult smartphone addiction, a lot of questions remain unanswered. Surprisingly, research from all across the globe shows that too much time spent on smartphones is bad for your health. The reliability of this study's findings is bolstered by the congruence with other research that have shown a correlation between smartphone addiction and negative psychological outcomes. Adolescents who are dependent on their cellphones underwent an investigation into the unfavorable relationship between mental health and self-control. Furthermore, there was no statistically significant difference between the sexes on the degree to which they were addicted to their smartphones. The results of other researchers (Chen *et al.*, 2017; Kwon *et al.*, 2013; T *et al.*, 2019) are in agreement with this one. That is to say, individuals who are looking for short-term gratification are more likely to get hooked to their smartphones than those who are looking for something more permanent. Therefore, we should modify existing mental health and self-control programs to foster more self-control and better mental health as a means of preventing smartphone addiction. Furthermore, we need to change the classroom dynamic so that students are more disciplined and their mental health improves.

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