

## Exploring the Influence of Smartphone Addiction on Health Disorders and Attention Deficit Hyperactivity Disorder (ADHD) of Adolescents in Rajasthan

<sup>1</sup>Nikita Nehra, <sup>2</sup>Prof. Rajesh Mehrotra

<sup>1</sup>Scholar, School of Business and Management, Jaipur National University, Rajasthan, India

<sup>2</sup>Director, School of Business Management, Jaipur National University, Rajasthan, India

Email Id- <sup>1</sup>nehranikita@gmail.com, <sup>2</sup>rajeshmehrotra7@rediffmail.com

### ABSTRACT

The excessive utilization smart phones has expanded dramatically, increasing the danger of addiction and generating serious health consequences, particularly in children. Smartphone addiction is a psychological and social issue that educational supervisors, psychiatrists, and psychologists have recommended. The current study aimed to find the association between different health disorders and attention deficit hyperactivity disorder (ADHD) symptoms in the population of Rajasthan. A randomly selected sample of 806 smartphone users was utilized to complete an online survey. Findings revealed that insomnia, eye strain, ADHD, insecure attachment, and smartphone misuse were positively correlated. Literature also revealed that the utilization of smartphones is responsible for the downfall in the grades of students. Furthermore, in-depth research is required in the future based on addiction scale comparison, qualitative data, and utilization comparison. Furthermore, future smartphone consumers should be cautioned about the potentially addictive features of new technologies.

**KEYWORDS:** Addiction, Attention Deficit Hyperactivity Disorder (ADHD), Anxiety, Health Disorders, Smartphone.

### 1. INTRODUCTION

The modern period may be defined as a convergence of technology and communication. We can now make relationships and transmit information quicker than ever before because of modern information and communication technologies. The smartphone has become the most prevalent sort of information and communication innovation, and its usage has increased significantly in recent years owing to societal influence. Addiction to mobile phones has attracted the interest of psychiatrists, sociologists, and educational academics as a mental handicap caused by contemporary technology [1], [2].

According to recent studies, the evidence to support heavy mobile phone usage as an addictive habit is limited. Billieux [3], in particular, has emphasized that there is inadequate information for psychological and neurobiological parallels amongst heavy usage of smartphones as well as other behavioral addictions. Panova and Carbonell [4] asserted that there is not enough information to establish the identification of mobile phone addiction, whereas Montag et al. [5] contended that heavy smartphone usage is a kind of Internet Usage Addiction. Smartphones are widely used for a variety of activities like gaming, social sites, and streaming videos (Instagram, YouTube etc.). As a result, heavy smartphone users may have different features depending on the kind of smartphones used.

Excessive smartphone usage was associated with deterioration in family function and friendship relationships, impulsive behavior, and poor self-esteem among South Korean teenagers. Furthermore, among teenagers, smartphone games were linked to prolonged smartphone usage.

### *1.1. Insecure Attachment, and Communication Problems*

In students with poor family function, the insecure attachment was associated with problematic smartphone usage but not with maternal mental well-being or mother-child bonding. In Problematic teenage users, Eichenberg et al. [6] discovered a link between extreme usage of smartphones and insecure attachments. Further research reported that maladaptive Cognitive-emotion regulation (CER) methods like catastrophizing ideas, brooding, blaming others, and self-blame were prevalent. Excessive smartphone and social network usage have been linked to experiential avoidance. Adolescents' problematic smartphone usage was linked to childhood emotional abuse, which was facilitated by social anxiety, sadness, and body image issues. Excessive smartphone usage was connected with emotional management issues, uncontrolled consumption, constrained eating, addiction to food, and increased fat among teenagers. Mahapatra [7] discovered a clear link between loneliness and lack of self-regulation, which led to family, poor academic performance, and interpersonal issues [8]–[10].

### *1.2. Comorbidity With Alcohol Use, ADHD, Depression, and Anxiety Disorder:*

Numerous research has been conducted on the comorbidity of heavy smartphone usage and psychological diseases, as well as its relationship with sleep issues, discomfort, and decreased fitness. Heavy smartphone usage has been linked to social anxiety, anxiety, depression [8], [11], [12], poor self-esteem and shyness [13], and low mental health [14], [15]. Excessive reassurance seeking was linked with the intensity of smartphone usage, and its interaction with cogitation moderated the connection between anxiety severity and smartphone use and problematic depression. Anxiety throughout the outbreak was associated with the level of smartphone usage, sadness, and overall anxiety [8], [16]–[22]. Alcoholism history and parent's educational levels elucidated 26% of the variation in smartphone usage. Furthermore, excessive smartphone usage was connected with alcohol use disorder, impulsivity, and an increased prevalence of PTSD, anxiety, and sadness.

### *1.3. Medical Problems- Pain, Migraine, Eyesight, Physical Fitness, and Sleep:*

Addictive smartphone usage was linked to decreased sleep quality and sleep time in teenagers. It was also reported that there is a link between the usage of sites before going to sleep, sleep disruption and depression. Additionally, there was a link between extreme sleep onset and screen time, inadequate sleep [23], and insomnia [24], [25]. Long-term mobile phone usage forecasted future cases of mental discomfort and sleep problems, which were alleviated by its withdrawal. Extreme smartphone usage was associated with poor sleep quality and disrupted sleep patterns. Excessive smartphone usage has been linked to worse sleep quality, greater felt stress [26]–[28], increased fat mass, reduced muscle mass and less physical activity.

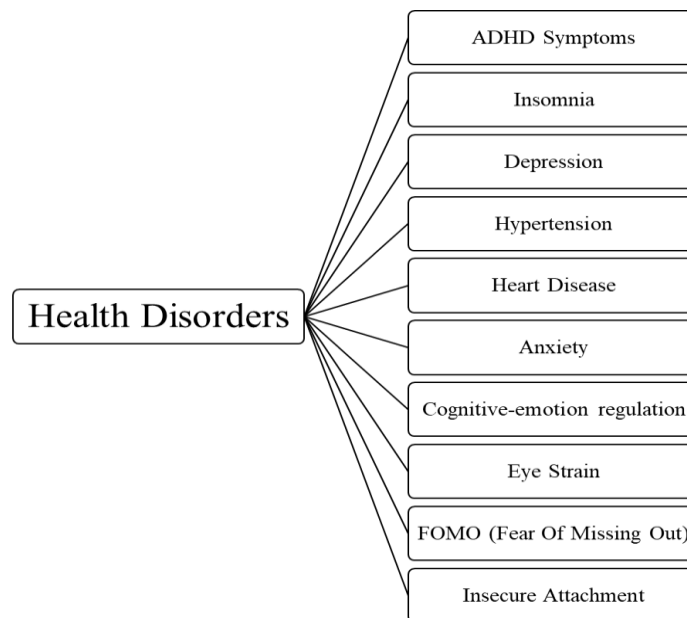
A smartphone is defined as "a mobile phone which fulfills a number of the duties of a computer, usually with a touchscreen interface, internet connection, and a system software that can run downloadable software". Only a few studies are conducted on the Rajasthan population and very less literature is available on the issue of ADHD symptoms and health disorders associated with the excessive utilization of the smartphone. The current study is conducted to

gain more knowledge on smartphone utilization and what are the detrimental effects of excessive utilization of smartphones.

## 2. METHODOLOGY

### 2.1. Design:

The current study is conducted from the year 2019 to 2020 on 806 people living in Rajasthan. According to the literature survey, a questionnaire was prepared to collect the data for 10 disorders people might have faced (Figure 1). Two groups were divided based on the utilization of smartphones. Furthermore, other demographics were also correlated with the utilization of smartphones in the adolescents residing in Rajasthan.



**Figure 1: Illustrating the Major Health Disorders Predicted in the Respondents**

### 2.2. Sample:

As shown in Table 1, it was reported that the majority of the respondents were Married. The majority of the population was residing with family and were consuming substances. It was also reported that the majority of the respondents have 1-5 years of education. Only 2% of the respondents were divorced. The majority were employed in the private sector and were self-sustainable. Substance habits were alcohol consumption, smoking, and any illegal substance (cocaine, opium, etc.).

**Table 1: Illustrating the Demographic Details of the Randomly Selected Respondents**

Demographic Details		N (%)
Gender	Male	333 (41.3%)
	Female	473 (58.7%)
Marital Status	Married	643 (79.8%)
	Never Married	30 (3.7%)
	Divorced	16 (2%)
	Widowed	117 (14.5%)

Residing with	Living with family	554 (68.7%)
	Separately	72 (8.9%)
	Elderly Care home	180 (22.3%)
Education	Uneducated	37 (4.6%)
	1-5 Year	321 (39.8%)
	6-12 Year	412 (51.1%)
	More than 13 years	36 (4.5%)
Employment	Self-employed	215 (26.7%)
	Private sector	227 (28.2%)
	Government sector	175 (21.7%)
	Homemaker	189 (23.4%)
Economic Status	Dependent on family	223 (27.7%)
	Pension	280 (34.7%)
	Salary	60 (7.4%)
	Self-sustainable	243 (30.1%)
Substance Habit	Yes	652 (80.9%)
	No	76 (9.4%)
	Sometimes	78 (9.7%)

### 2.3.Data Collection:

Based on Demographic details, it was reported that Females were more addicted to the smartphone as compared to males. Also, married people who are living with families were majorly addicted. Also, it was reported that smartphone was addictive with the utilization of substances like alcohol consumption, drugs, or smoking. Also, educated people (1-12 years of education) were more addicted to smartphone utilization (Table 2).

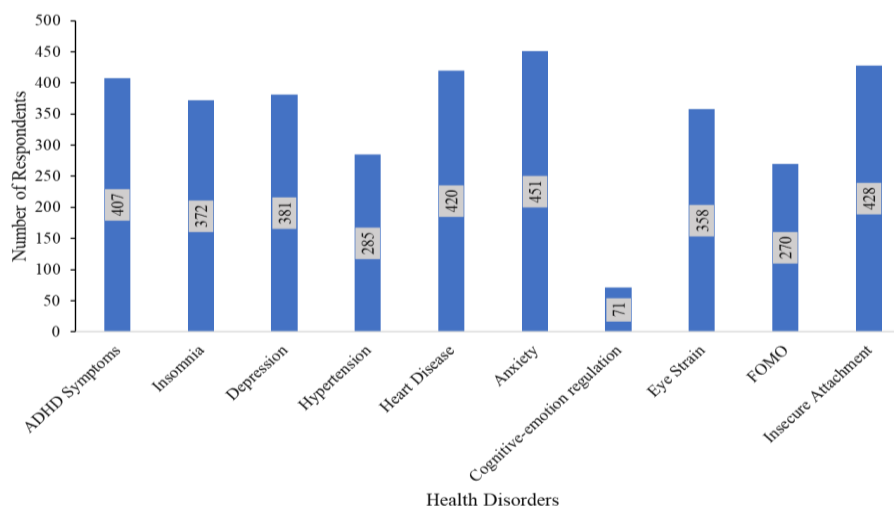
**Table 2: Illustrating the Demographic Details and Smartphone Addiction of Randomly Selected Respondents**

Smartphone Addiction			
		Yes N (%)	No N (%)
Gender	Male	173 (38%)	160 (45.6%)
	Female	282 (62%)	191 (54.4%)
Marital Status	Married	352 (77.4%)	291 (82.9%)
	Never Married	17 (3.7%)	13 (3.7%)
	Divorced	7 (1.5%)	9 (2.6%)
	Widowed	79(17.4%)	38(10.8%)
Residing with	Living with family	324(71.2%)	230(65.5%)

	Separately	29(6.4%)	43(12.3%)
	Elderly Care home	102(22.4%)	78(22.2%)
Education	Uneducated	17(3.7%)	20(5.7%)
	1-5 Year	179(39.3%)	142(40.5%)
	6-12 Year	243(53.4%)	169(48.1%)
	More than 13 years	16(3.5%)	20(5.7%)
Employment	Self-employed	95(20.9%)	120(34.2%)
	Private sector	139(30.5%)	88(25.1%)
	Government sector	93(20.4%)	82(23.4%)
	Homemaker	128(28.1%)	61(17.4%)
Economic Status	Dependent on family	145(31.9%)	78(22.2%)
	Pension	176(38.7%)	104(29.6%)
	Salary	19(4.2%)	41(11.7%)
	Self-sustainable	115(25.3%)	128(36.5%)
Substance Habit	Yes	396(87%)	256(72.9%)
	No	21(4.6%)	55(15.7%)
	Sometimes	38(8.4%)	40(11.4%)

#### 2.4.Data Analysis:

As shown in Figure 2, Smartphone addiction was not associated with Cognitive-emotion regulation as compared to the other 9 health disorders. It was also reported that approximately 50% of the respondents were suffering from ADHD Symptoms. Also, Heart Diseases, Insecure feelings of attachment, and anxiety were the major health disorders in approximately 50% of the respondents.



**Figure 2: Illustrating the Major Health Disorders Associated with the Addiction of the Smartphone**

### 3. RESULT AND DISCUSSION

As shown in Table 3, There was a strong, positive correlation between ADHD symptoms, insomnia, eye strain, and insecure attachment to Smartphone addiction. It was reported that ADHD Symptoms were statistically significant ( $r = 0.681$ ,  $n = 806$ ,  $p < 0.005$ ). It indicates that people who have smartphone-addicted respondents have 68.1% more chances of having ADHD Symptoms. Insomnia was statistically significant ( $r = 0.534$ ,  $n = 806$ ,  $p < 0.005$ ). It indicates that people who have smartphone-addicted respondents have 53.4% more chances of having ADHD Symptoms. Eye strain ( $r = 0.635$ ,  $n = 806$ ,  $p < 0.005$ ) and insecure attachment ( $r = 0.451$ ,  $n = 806$ ,  $p < 0.005$ ) were also statistically significant. It indicates that people who have smartphone-addicted respondents have 63.5% and 45.1% more chances of having eye strain and insecure attachments. Though it was reported that depression, hypertension, heart disease, anxiety, and cognitive emotion regulation were not statistically significant. Also, there was a weak, positive correlation between FOMO, which was statistically significant ( $r = 0.335$ ,  $n = 806$ ,  $p < 0.005$ ). It indicates that people who are suffering from smartphone addiction have 33.5% more chances of FOMO.

**Table 3: Correlation Between the Smartphone Addiction and Health Disorders & ADHD Symptoms**

Smartphone Addiction		
ADHD Symptoms	r	0.681
	Sig.	0.003
Insomnia	r	0.534
	Sig.	0.000
Depression	r	-0.026
	Sig.	0.462
Hypertension	r	-0.048
	Sig.	0.176
Heart Disease	r	0.035
	Sig.	0.316
Anxiety	r	-0.026
	Sig.	0.466
Cognitive-emotion regulation	r	0.078*
	Sig.	0.027
Eye Strain	r	0.635**
	Sig.	0.000
FOMO	r	0.335
	Sig.	0.000
Insecure Attachment	r	0.451
	Sig.	0.002

#### 4. CONCLUSION

Finally, because of the ease of access and complete reliance on smartphones in our everyday lives, the physical and mental effects should be investigated across diverse demographics. The demographic under study is underestimated in the medical literature. As a result, we intend to broaden our present understanding of the Rajasthan population to incorporate information on smartphone addiction. In the present research, we discovered a positive relationship between insomnia, eye strain, ADHD, insecure attachment, and smartphone misuse. As a result, we urge the scientific community to investigate the effects of smartphone addiction on people's mental health. Lastly, we urge that anybody experiencing insomnia, eye strain, ADHD symptoms, or insecure attachment be closely observed.

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