SMARTPHONE SHACKLES: UNRAVELING THE MENTAL TOLL OF DEVICE DEPENDENCY ON INDIAN UNDERGRADUATES

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Abstract

The research delves into exploring the correlation between excessive smartphone utilization and its effects on mental well-being, social interactions, cognitive abilities, and academic performance. It also examines the cultural and situational elements influencing smartphone dependency among Indian college students. A thorough review of existing literature indicates that over-reliance on smartphones leads to heightened levels of stress, anxiety, depression, and diminished life satisfaction. Moreover, prolonged smartphone use diminishes face-to-face communication, empathy, and fosters feelings of social seclusion. Statistical analyses, including one-way ANOVA and multilinear regression (MLR), were employed to scrutinize the association between Technical and Non-Technical Universities. A survey involving 1051 students revealed that a significant portion exhibited problematic smartphone usage to varying degrees. The primary motive behind their smartphone usage was accessing social networking apps, predominantly Instagram. Interestingly, the students' field of study (science-based vs. Management) did not significantly influence their susceptibility to addictive behavior patterns. The study's findings offer valuable insights for university administrators, aiding them in identifying specific cohorts of undergraduate students prone to addictive smartphone habits. This knowledge can be pivotal in devising targeted interventions tailored to address the unique needs of these high-risk groups, with the aim of mitigating their addictive smartphone behaviors.

Index Terms: Smartphone Dependency Measurement, Educational Context, Online Social Networking, India.

INTRODUCTION

Smartphones' pervasiveness has revolutionized how we communicate, access information, and navigate our daily lives. However, as smartphone usage becomes increasingly prevalent, concerns have arisen regarding its potential negative impact on mental health and well-being, particularly among university undergraduate students in India. This literature review explores existing research on the psychological implications of smartphone reliance and device dependency among Indian university undergraduates. The widespread adoption of smartphones has revolutionized communication and transformed various aspects of our lives. These sleek and sophisticated devices have become integral to our daily routines, providing constant connectivity, entertainment, and access to much information. However, as the reliance on smartphones grows, concerns about their psychological implications, particularly among university undergraduate students, have emerged. The unprecedented access to smartphones has led to a significant shift in how individuals engage with technology and interact with the world around them. Indian university undergraduates, in particular, have embraced smartphones as a tool for academic pursuits, socializing,

and entertainment. While smartphones offer undeniable benefits, such as enhanced productivity and connectivity, a growing body of evidence suggests that excessive reliance on these devices may harm psychological well-being (Verma et al., 2023). This research aims to delve into the phenomenon of smartphone reliance among Indian university undergraduate students and uncover its psychological implications (Swaminathan, 2020). By examining the various aspects of device dependency, including patterns of usage, addictive behaviours, and the impact on mental health, this study seeks to shed light on the potential consequences of being shackled to smartphones(Ahmad et al., 2020). Understanding the psychological toll of smartphone reliance is crucial for several reasons. First, university undergraduate students are a vulnerable population, transitioning from adolescence to adulthood while simultaneously navigating the demands of higher education (Mukherjee, Sayantan; Neogi & Verma, Ajay 2024). Excessive smartphone usage during this critical period may interfere with their cognitive development, academic performance, and overall well-being. Second, the Indian context provides a unique perspective due to the country's diverse cultural and socioeconomic landscape (Halili & Zainuddin, 2015). Exploring the psychological implications of smartphone reliance, specifically within the Indian university undergraduate population, can help uncover any cultural, contextual, or demographic factors that may contribute to or mitigate the observed effects (Bayer et al., 2018). Lastly, this research has practical implications for various stakeholders, including educational institutions, policymakers, and mental health professionals (Aarons et al., 2009). Identifying the psychological consequences of smartphone reliance can inform the development of interventions, guidelines, and support systems to help students strike a healthy balance between smartphone usage and overall well-being (Throuvala et al., 2021). By unravelling the mental toll of device dependency on Indian university undergraduate students, this study aims to contribute to the existing body of knowledge on smartphone addiction, inform policy and practice, and ultimately promote a healthier relationship with technology among this vulnerable population.

LITERATURE REVIEW

Smartphone Addiction and Psychological Well-being:

Numerous studies have investigated the relationship between smartphone addiction and psychological well-being. Excessive smartphone use has been linked to increased stress, anxiety, depression, and decreased life satisfaction among university students(Elhai et al., 2017). The constant need to stay connected and fear of missing out (FOMO) can lead to social isolation and withdrawal from real-life interactions, further exacerbating psychological distress(Chotpitayasunondh & Douglas, 2016). Additionally, smartphone addiction has been associated with poorer sleep quality, attention deficits, and decreased academic performance(LIU et al., 2017).

Impact on Interpersonal Relationships:

Smartphone reliance can significantly affect interpersonal relationships and social interactions. Research suggests excessive smartphone use is associated with reduced face-to-face communication, decreased empathy, and increased loneliness and social isolation (Sprecher et al., 2016). The constant presence of smartphones during social interactions can lead to divided attention and a diminished sense of intimacy, impairing the quality of relationships among university students (Roberts et al., 2014).

Cognitive and Academic Consequences:

The impact of smartphone reliance extends to cognitive functioning and academic performance. Studies have shown that heavy smartphone use is associated with decreased attention span, reduced cognitive control, and lower levels of intellectual engagement(Rosen et al., 2013). Furthermore, frequent multitasking between smartphones and academic tasks has been linked to lower educational achievement and poorer learning outcomes(Rozgonjuk et al., 2020).

Cultural and Contextual Factors:

Understanding the cultural and contextual factors that influence smartphone reliance among Indian university undergraduates is essential. Cultural norms, social pressures, and socioeconomic factors may shape this population's patterns and motivations for smartphone use (Dhir et al., 2018). Exploring these factors can provide valuable insights into the unique challenges and opportunities for intervention specific to the Indian context. Factors may shape this population's patterns and motivations for smartphone use (Bindra et al., 2019). Exploring these factors can provide valuable insights into the unique challenges and opportunities for intervention specific to the Indian context. Excessive smartphone use adversely affects psychological well-being, interpersonal relationships, cognitive functioning, and academic performance. Cultural and contextual factors play a significant role in shaping smartphone dependency patterns among Indian undergraduates (Neogi, Shromona; Mukherjee, Sayantan; Verma, Ajay 2024). Given the potentially detrimental effects, it is crucial to develop interventions, educational programs, and support systems that promote healthy smartphone usage habits and mitigate the negative consequences. By unravelling the mental toll of device dependency, the research aims to contribute to existing literature, inform policy and practice, and ultimately improve the well-being of Indian university undergraduates in the smartphone era.

MATERIALS AND METHODS

Participants: The study included a sample of Indian university undergraduate students aged between 18 and 25 years by using a convenience sampling method. A diverse range of universities from different regions of India was selected to ensure representation across various cultural and socioeconomic backgrounds.

Measurement Instruments: Smartphone Addiction Scale: The participants' smartphone dependency was assessed using a validated measure such as the Smartphone Addiction Scale (SAS) (Kwon et al., 2013). The SAS consists of items that evaluate various dimensions of smartphone addiction, including excessive use, withdrawal symptoms, and interference with daily life.

Questionnaire on Psychological Well-being: The participants' psychological well-being was assessed using a standardized questionnaire, such as the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) (Tennant et al., 2007). The WEMWBS measures various aspects of mental well-being, including positive affect, life satisfaction, and overall psychological functioning.

Statistical Analysis

The data were analyzed using SPSS version 26. Descriptive statistics, such as tables for categorical data and medians with ranges for continuous variables, were used to describe the general demographic data of the students. Independent-sample t-tests were conducted to compare continuous variables. Pearson's correlation analysis was performed to determine the strength of the relationship between SAS-M scores and smartphone usage patterns, including years of smartphone use and daily duration of smartphone use. Statistical significance was set at $p < 0.05$.

Table 1: Sociodemographic details (n = 1051)

Variable(s)	Gender	n (%)	Mean ± SD	P-value
Age (years)	Male	786(74.7)	21.16±2.19	0.002
	Female	265 (25.2)	20.91±1.72	
Field of study				
Mathematics		379(35.8)		
Computer science		255(24.12)		
Commerce		422(39.94)		
Family Income				
<10000		605(57.09)		
10000 – 50,000		309(29.12)		

Table 2: Respondents' sociodemographic details (n = 1051)

	Department	Min-Max	Mean ± S.d.	f-test	p-value
Age at initial smartphone usage(years)	Mathematics	5-20	14.06±2.83	5.911	0.002
	Computer science	5-18	13.29±2.48		
	Management	5-20	13.61±2.56		
Duration of smartphone usage	Computer science	1-17	6.29±2.83	4.626	0.01
	Management	1-16	6.12±2.73		
	Mathematics	2-18	6.75±2.91		
Average daily smartphone usage duration (in hours)	Computer science	1 -22	7.63±4.829	2.385	0.056
	Management	1-22	8.25±5.41		
	Computer science	1-24	8.39±4.96		

Table 3: Multiple Regression Analysis Mode

Factors	Unadjusted (Simple regression)		Adjusted (Multiple regression)		VIF
	Coefficient	Sig.	Coefficient	Sig.	
Age	-0.294				
	(-1.319, 0.660)	0.514	-	-	-
Age at initial smartphone usage(years)	-0.798				
	(-1.487, -0.219)	0.02	-0.894		
	(-1.631, -0.318)	0.002	1.231		
Duration of smartphone usage	-0.293				
	(-1.025, 0.348)	0.241	-0.525		
	(-1.068, -0.109)	0.113	1.21		
Average daily smartphone usage duration (in hours)	0.913		0.927	<0.001	1.021
	(0.612, 1.214)	<0.001	(0.620, 1.213)		
Stress	0.239	0.521			
	(-0.241, 0.524)				
Anxiety					

	0.383	0.204	0.412	0.032	2.234
	(-0.049, 0.694)		(0.0323 0.502)		
Depression	0.495	0.004	0.428	<0.001	2.22
	(0.235, 0.794)		(0.310, 0.752)		
Sciences-based studies	3.342	0.073	3.052	0.101	1.149
	(-0.532, 7.105)		(-0.725, 6.402)		
F			20.12		
p-value			0.002		
Adjusted R^2			0.087		

Between smartphone usage patterns and students' ethnic groups, hand dominance, and field of study. Specifically, one-way ANOVA was employed to investigate the association between the average daily smartphone usage time and the three domains of study: Mathematics, Computer science, and Management. Multilinear regression analysis (MLR) was conducted to predict PSU (Psychological Symptomatology of Smartphone Use) based on sociodemographic data, smartphone usage patterns, psychological factors, and field of study. One-way ANOVA was utilized to examine the correlation.
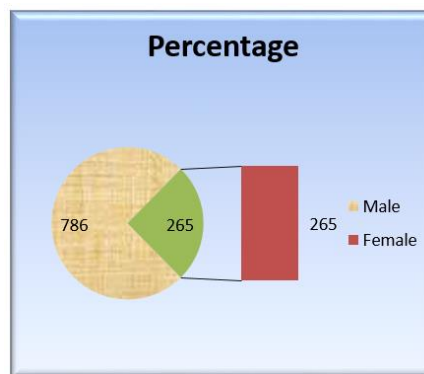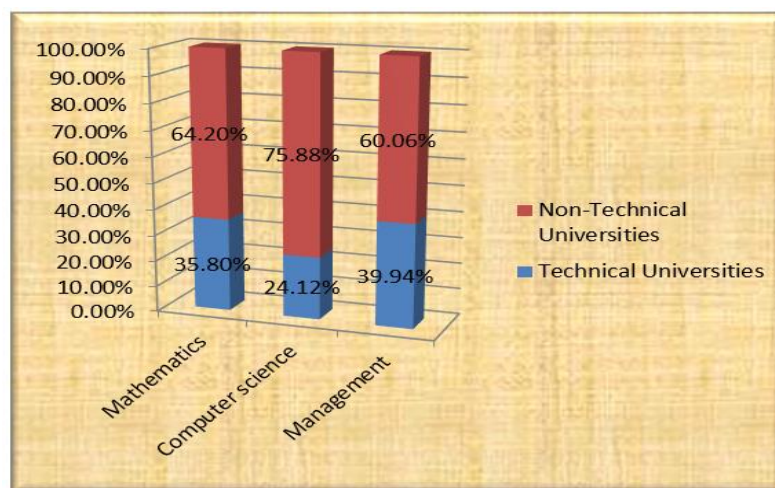

Figure 1: Demographic Overview

Figure 2: Study field-based distribution of problematic smartphone use among students

RESULTS AND DISCUSSION

One thousand fifty-one completed questionnaires were received, resulting in a response rate of approximately 75%. The respondents, aged between 18 and 25 years, represented various faculties. Table I shows that the majority of respondents were male, with a ratio of 1:3. The respondents were categorized into three main fields of study: Mathematics (n=379, 35.8%), Computer science (n=255, 24.12%), and Management(n=422, 39.94%), as shown in Table I. The average age at which students initially started using smartphones was 16.5 years. Male students reported a mean age of 14.19 (±2.63) years, while female students reported a slightly younger mean age of 13.49 (±2.58). Furthermore, the duration of smartphone usage was significantly higher among female students (mean = 5.79 ± 2.89 years) compared to male students (mean = 6.59 ± 2.89 years), with a p-value of less than 0.002. No statistically significant differences were found through one-way Analysis of variance regarding the age at which students first started using smartphones, the duration of smartphone usage in years, and the average daily time spent on smartphones when considering hand dominance. However, significant differences were observed among students from different fields of study (Mathematics, Computer science, Management) regarding the age at which they first started using smartphones and the duration of smartphone usage in years (p < 0.05). On the other hand, the average daily time spent using smartphones did not show significant differences among the three field of study groups, as indicated in Table II. Based on the data presented in Table III, the variables considered for inclusion in the multivariable Analysis were the age at which individuals started using smartphones, the average daily time spent using smartphones, anxiety levels, and depression levels.

It should be noted that higher values of the Pearson correlation coefficient and coefficient of determination indicate greater accuracy in predicting Smartphone Addiction scores and using the prediction Model. This suggests that a longer duration of daily smartphone usage, a younger age at which individuals started using smartphones, and higher levels of depression are associated with an increased risk of Technical University Students compared to Non-Technical University.

CONCLUSION

The findings highlight several key points. Firstly, smartphone addiction is prevalent among this population, with a significant proportion of students dependent on their devices. The duration of smartphone usage per day was substantial, with male students spending more time on smartphones than female students(Cha & Seo, 2018). The study also reveals that the age at which students first start using smartphones and the duration of smartphone usage significantly impact their psychological well-being. The younger generation at initial smartphone usage and more extended smartphone use is associated with higher risks of developing psychological symptoms related to smartphone dependency.

Moreover, the presence of anxiety and depression further exacerbates the adverse effects of smartphone reliance(Davey & Davey, 2014). These findings emphasize the need for interventions and support systems to address smartphone addiction among university undergraduates in India. Technical and non-technical Educational institutions should implement awareness programs and promote healthy smartphone usage habits among students. Mental health support services should be readily

available to address the psychological toll of device dependency. Policymakers, educators, and parents need to recognize the impact of smartphone reliance on students' mental health and well-being. By understanding the factors contributing to smartphone addiction and its consequences, appropriate measures can be taken to mitigate its adverse effects(Shilpa Bisen & Dr. Yogesh Deshpande, 2016). Future research should continue to explore interventions and strategies to promote a balanced and healthy relationship with smartphones among university students.

Overall, this research contributes to the growing knowledge of smartphone addiction and its psychological implications in the Indian context. It underscores the urgency of addressing smartphone shackles and fostering a healthier digital environment for Indian university undergraduates.

Acknowledgement

Ethical Statement

Conflict of Interest

The authors declare that they have no conflicts of interest.

Data Availability

All the data sets used in this research paper are available from the corresponding author upon request.

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