SMARTPHONE ADDICTION AMONG UNIVERSITY STUDENTS: DIFFERENCE IN GENDER AND ACADEMIC STREAMS

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ABSTRACT
The emergence of advancement technology has enabled the students to access the vast knowledge and information easily and quickly. In the case of university students, without spending on educational activities they have spent much time on social media, online games, watching videos, shopping etch via smartphone. The excessive amount of time spent on smartphones may lead to addictive behaviour. The aim of this study was to investigate the rate prevalence of smartphone addiction and difference in gender and academic streams in relation to smartphone addiction. The investigator has used descriptive survey method to conduct this study. One hundred ten (110) participants were selected by using stratified random sampling. Smartphone addiction scale developed by Dr. Vijayshree and Dr. Masaud Ansari in 2020 was used for data collection. The prevalence of smartphone addiction among university students shows that more than 40% of students are reported above average level of smartphone addiction among which only 11% students are highly addicted. Though gender was not a significant predictor (β- 1.620, R^2- 0.003, F- 0.278, P>0.05) but academic streams were significant predictors of smartphone addiction (R^2- 0.185, F-11.972, P<0.01). The result of the t-test shows that there is no significant difference between male and female students in smartphone addiction (t-0.527, P>0.05) and F test shown that there is significant difference among the different streams of students in smartphone addiction (F-011.972, P<0.01). Similarly, the result of two-way ANOVA shows that there is a significant interaction effect of gender and academic streams on smartphone addiction (F- 4.940, P<0.01).

Introduction

The 21st century has brought revolutionary change in the field of science and technology. The use of advanced technology such as smartphones, computers, and the internet has enabled the individuals to easily connect, communicate, and collaborate with others. Similarly, students can easily access the vast amount of knowledge and information with the help of pocket-sized devices (Smartphones). This device provides an opportunity to make collaborative work, stay updated with new course materials, communicate with peers, access the online educational resources and academic platforms for their academic and non-academic activities (Anshari et al., 2017). However, along with the number of positive outcomes by using of smartphone, the excessive and uncontrolled use of this device may lead to addictive behaviour among the students.

Smartphone addiction refers to a situation where an individual cannot be able to control his urge or excessively use their phone which may adversely affect their daily life activities (Ching et al., 2015). They have spent significant amount of time on smartphone for various purposes like chatting, calling, streaming, scrolling, and communicating etc. On the other hand, they constantly check their phone due to the fear of missing call, messages, notifications, and updates. This uncontrolled use of smartphones may affect their mental health in the form of increasing stress and anxiety (Rozgonjuk et al., 2019). It has been found that the excessive use of smartphones can significantly affect the physical, mental, and social well-being of the individuals (David et al., 2018). Some other terms such as 'excessive use of smartphones' (Sut et al., 2016), 'addiction proneness' (Kim et al., 2014), 'smartphone overuse', and 'problematic mobile phone use' (Ding & Li, 2017) have been used to denote smartphone addiction.

University students are more likely to be smartphone addicted as compared to the other students. University students get maximum freedom or autonomy from the restriction of their parents in relation to making their own decisions or choices as well as decide where they spend time and how they engage with technology. This phenomenon can be explained by self-determination theory. This theory explains the individual's needs for autonomy, competence, and freedom. This theory states that how an individual chooses their personal values and interests when he will get freedom or autonomy. In this regard, university students perceive their freedom as an opportunity to use smartphones excessively or compulsively. Moreover, university students have experienced unique academic challenges, career pressure, social and professional commitments which can be directly related

with the increase of stress and anxiety among themselves (Crocker & Luhtanen, 2003). In this situation, they have engaged in social media, online video games, and other online activities to get relaxation from these pressures or stressors (Desai et al., 2021). But excessive or compulsive use of smartphones may further lead to smartphone addiction.

Background Of The Study

The use of smartphones becomes an integral part of every individual. Similarly, it is nearly impossible to see a college going student without a smartphone. Smartphones provide multiple platforms for communication and information sharing via chatting apps and social media. Appropriate utilisation of smartphones may give the positive results whereas uncontrolled use of this may negatively affect the psycho-social life of the students.

Smartphone use has been significantly increased among university students throughout the world. A survey conducted by Deloitte Global Mobile Consumer on 51000 samples from 32 countries (age 18-24) and found that 93% participants have smartphone ownership and spent significant amounts of time on smartphone (as cited by Alotaibi et al., 2022). It has been also reported that 21.8% Nepali students (Kriti Thapa et al., 2020), 29.8% Chinese students (Mei et al., 2018), 36.7% Iranian students (Tavakolizadeh et al., 2014), and 45.7% Bangladeshi students (Ghosh et al., 2022) have experienced smartphone addiction. In India, Davey & Davey (2014) found that the prevalence rate of smartphone addiction is ranges from 39% to 44%. They use smartphones for the purpose of web browsing, streaming videos, and checking notifications in social media (Buctot et al., 2020).

Along with the high prevalence rate of smartphone addiction, it has been found that student's personal attributes have significant role in becoming smartphone addictions. Student's own interest to adopt new technologies (Olson et al., 2011), use interactive applications such as Facebook, Instagram, WhatsApp, YouTube etc may increase the smartphone dependency (Ghosh et al., 2022). Some studies have found that boys are more addicted to smartphones as compared to females (Daei et al., 2019). Some other studies show that female students are more addicted to smartphones as compared to male students (Domple et al., 2017; Sanchez-Martinezto et al., 2009). Additionally, some other studies show that there is no significant difference between male and female students in relation to their smartphone dependence (Choliz et al., 2016; Ghosh et al., 2022). Though female students use smartphones for the purpose of social interaction and shopping, but male students use smartphone for the purpose of gaming, watching adult videos, and communication (Choliz et al., 2016).

It has been reported that academic performance of university students has negative relation with smartphone addiction (Lepp et al., 2014; Giunchiglia et al.,2018). Excessive use of smartphone can increase the level of mental health problems such as stress, anxiety, and depression (Samaha et al., 2016; Wan Ismail et al., 2020), Nomophobia (Sar et al., 2012), and reduce personal well-being & life-satisfaction (Volkmer et al., 2019). Studies have found that smartphone addicted students have faced problem in physical activity, body pain, and sleep pattern (Lepp et al., 2013; Kim et al., 2015; Shah & Seth, 208; Matar Boumosleh &Jaalouk, 207; Demrici et al., 2015). It has also affected the peer and family relationship of the students (Chui, 2015).

Need And Significance Of The Study

The aim of this study is to examine the smartphone addiction among the university students in relation to their gender and academic streams. Though the use of smartphones has made the difficult work easy, enabling the students to access vast amounts of information, but its excessive use can lead to serious consequences. Smartphone addiction can reduce the attention power, critical thinking and increase the distraction which may result in low academic performance. So, it is necessary to conduct a study on smartphone addiction among university students so that necessary interventions and strategies will be developed to promote overall educational experience and academic well-being among students.

Objectives Of The Study

1. To study the difference between male and female students in terms of smartphone addiction.
2. To study the difference among arts, science, and commerce students in terms of smartphone addiction.
3. To study the interaction effect of gender and academic streams on smartphone addiction.

Hypothesises Of The Study

$H_0$1: There is no significant difference between male and female students in terms of smartphone addiction.

$H_0$2: There is no significant difference among arts, science, and commerce students in terms of smartphone addiction.

$H_0$3: There is no significant interaction effect of gender and academic streams on smartphone addiction.

Methodology

Method: This study was quantitative in nature. For this study, descriptive survey method was used.

Participants: At initial stage two undergraduate colleges were selected from the Bargarh district affiliated under Sambalpur University purposively. Next, 55 students from each college were selected from various academic streams among which 60 are male & 50 are female, 50 from arts, 30 from science, and 30 from commerce. For this purpose, stratified random sampling was used.

Tools: The investigator has used a standardised Smartphone addiction scale developed by Dr. Vijayshree and Dr. Masaud Ansari in 2020 for the purpose of data collection. This scale contains 23 items and 6 dimensions such as compulsion, forgetfulness, lack of attention, depression and anxiety, disturbed hunger or sleep, and social withdrawal.

Statistical techniques used: The collected data were analysed with the help of simple percentage, mean, standard deviation, t-test, ANOVA, and linear regression. SPSS 27 was used for this purpose.

Descriptive Analysis

Table-1 Prevalence rate of smartphone addiction

Level of Smartphone Addiction	Number of students			Percentage		
	M	F	Overall	M	F	Overall
Very high level	3	2	5	3.3%	2.2%	5.5%
High level	3	2	5	3.3%	2.2%	5.5%
Above average level	17	11	28	18.7%	12.1%	30.8%
Average level	25	15	40	27.5%	16.5%	44%
Below average level	14	13	27	15.4%	14.3%	29.7%
Low level	3	2	5	3.3%	2.2%	5.5%

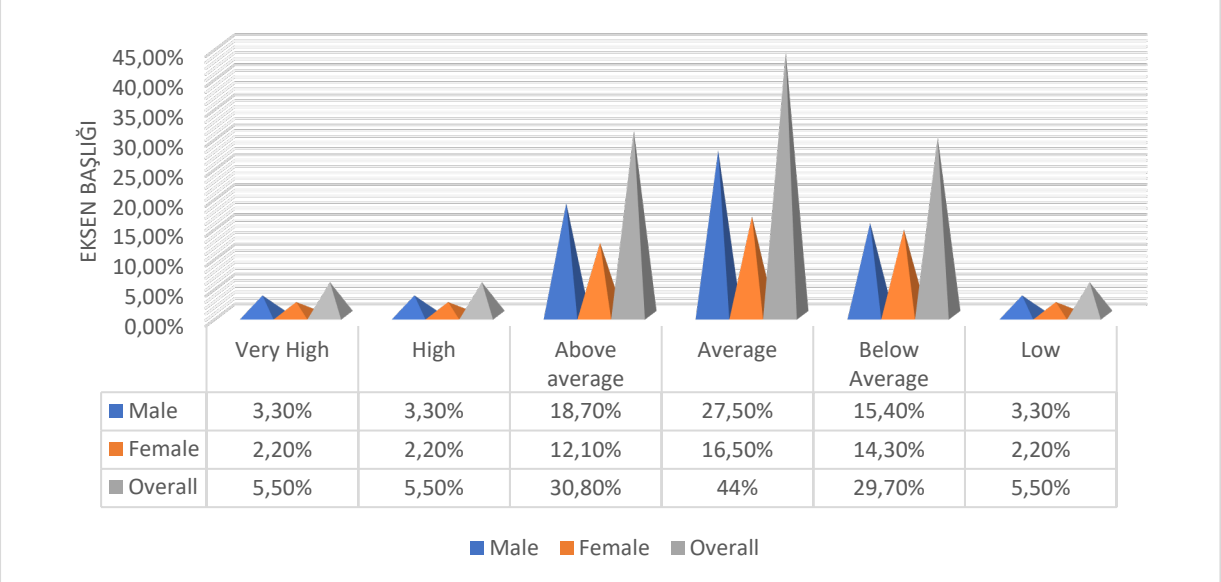

Figure-1

From the above table and figure 1 it can be said that 5.5% university students are very high level of addicted, 5.5% students are high-level addicted, 30.8% students are above average level of addicted, 44% students are

average level addicted, 29.7% students are below average of addicted, and 5.5% students are low level of smartphone addicted. For male group of students, 3.3% students are very high level of smartphone addiction, 3.3% high level of smartphone addiction, 18.70% students are above average level of addiction, 27.50% students are average level of addiction, 15.4% are below average level of addiction, and 3.3% are low level of smartphone addiction. For the female group of students, 2.2% students are very high level and high level of addiction, 12.10% students are above average level of addiction, 16.5% students are average level of addiction, 14.3% students are below average level of addiction and 2.2% are low level of smartphone addiction.

Table-2 Mean and SD of gender and academic streams

Category	Group	Mean	SD
Sex	Male	85.12	12.60
	Female	83.50	18.42
Academic streams	Arts	82.88	13.74
	Commerce	76.30	17.24
	Science	94.30	13.02

The above table shows the mean and standard deviation of both categories. The means and standard deviation for male students is 85.12 & 12.60 respectively whereas for female students is 83.50 & 18.42 respectively. Similarly, the mean and standard deviation for Arts students is 82.88 & 13.74 respectively, for Commerce students 76.30 & 17.24 respectively, and for science students 94.30 & 13.02 respectively.

Predictor Analysis

Table-3 Simple linear regression for gender and academic streams

Model	Regression weight		β	R^2	f-value	p-value	t-value	p-value
1	Sex	Male Female(ref.)	1.620	0.003	.278	.599	.527	.599
2	Academic streams	Arts(ref.) Commerce Science	-6.580 11.553	0.185	11.972	.001	1.952 3.425	0.05 0.001

Simple linear regression was used for predictor analysis by converting the above independent variables into dummy variables. Female students were considered as reference group for the first model whereas Arts students were considered as reference group for the second model.

It has been depicted from the first model that sex was not a significant predictor of smartphone addiction as F- 0.278, P-0.599, R^2- 0.003. From the result of the second model, it can be concluded that academic streams were a significant predictor of smartphone addiction as F- 11.972 P- 0.001. Academic streams explain 18.5% variation in smartphone addiction as R^2-0.185. The beta coefficient between arts and commerce significantly explains that commerce students were predicted to have 6.58 lower scores as compared to arts students as β= -6.58, t- 1.952, P<0.05. Similarly, the beta coefficient between arts and science students significantly explains that science students were predicted to have 11.553 higher score in smartphone addiction as compared to arts students as β- 11.533, t- 3.425, P<0.01.

Difference Analysis

1. Gender differences:

The first objective of this study is to study the difference between male and female students in terms of smartphone addiction. In this regard, t-test was employed with the help of SPSS 27.

Table-4 t-test for gender

Groups	Category	N	t-value	df	p-value
Gender	Male	60	0.527	108	0.599
	Female	50			

It can be concluded from the above table that male and female students cannot be significantly differed in terms of smartphone addiction as t-value is 0.527 and p-value is 0.599. So, the formulated null hypothesis is not rejected.

2. Academic streams differences:

Another objective is to investigate the difference among the arts, commerce, and science students in smartphone addiction. In this situation ANOVA was run with the help of SPSS 27.

Table-5 ANOVA for academic streams

Source of variance	Sum of squares	df	Mean squares	F-value	p-value
Among group	5100.908	2	2550.454		
Within group	22794.947	107	213.037	11.972	0.001
Total	27898.855	109			

From the above ANOVA table, it can be concluded that Arts, Science, and Commerce students can be significantly differed in terms of smartphone addiction as f-value for the degree of freedom (2,107) is 11.972 and p-value is 0.001. So, the formulated null hypothesis is rejected at 0.01 level of significance.
Turkey method has been used by the researcher to know whether a significant difference exists among the different academic streams or not.

Table-6 Multiple comparison (post-hoc test)

(I) Stream	(J) Stream	Mean difference (I-J)	Std. Error	Sig.	95% confidence interval	
					Lower Bound	Upper Bound
Arts	Commerce	6.580	3.371	.129	-1.43	14.59
	Science	-11.553**	3.371	.002	-19.56	-3.54
Commerce	Arts	-6.580	3.371	.129	-14.59	1.43
	Science	18.133**	3.769	.001	-27.09	-9.18
Science	Arts	11.553**	3.371	.002	3.54	19.56
	Commerce	18.133**	3.769	.001	9.18	27.09

*Significant at 0.05
**Significant at 0.01

From the multiple comparison it can be said that Arts and Commerce students cannot be significantly differed as the mean difference between them is 6.580 (<0.05). On the other hand, Arts and Science students can be significantly differed as the mean difference between them is 11.553 (>0.01). Similarly, Commerce and science students can also be significantly differed in terms of smartphone addiction as the mean difference between them is 18.133 (>0.01)

3. Interaction effect of gender and academic streams on smartphone addiction:

Another objective is to study the interaction effects of gender and academic streams on smartphone addiction. In this situation, two-way ANOVA was run via SPSS 27.

Table-7 Mean and SD for gender having arts, commerce, and science streams

Gender	Academic streams	Mean	Std. deviation	N
Male	Arts	83.60	14.099	30
	Commerce	82.80	10.157	15
	Science	89.47	12.403	15
		85.12	12.605	60
Female	Arts	82.40	13.718	20
	Commerce	69.80	20.547	15
	Science	99.40	12.034	15
		8350	18.429	50
Total	Arts	82.88	13.741	50
	Commerce	76.30	17.243	30
	Science	94.43	13.027	30
		84.24	15.998	110

Table-8 Two-way ANOVA

Source	Type III sum of squares	df	Mean squares	F	Sig.
Corrected model	7125.721[a]	5	1425.144	7.136	.000
Intercept	735778.337	1	735778.337	3684.182	.000
Gender	52.013	1	52.013	.260	.611

Academic stream	5081.630	2	2540.815	12.722**	.000
Gender*Academic stream	1973. 007	2	986.504	4.940**	.009
Error	20770. 133	104	199.713		
Total	808430. 000	110			
Corrected total	27895. 855	109			

a. R squared = .255 (Adjusted R squared = .220)

It can be concluded from the above table that male and female students can be significantly differed having Arts, Commerce, and Science streams as the value of factorial ANOVA (2*3) is 4.940 (>0.01). So, the formulated null hypothesis is significantly rejected.

Discussion

Among the various technological advancements in 21st century, the development of smartphones is one which provides various opportunities to learn, share, and collaborate with others very easily. This pocket-sized device has both positive and negative results. It provides various platforms to the students to access the information, online educational resources, and make collaborative work with others. But its excessive or uncontrolled use can lead to serious consequences among the students such as stress, anxiety, disturbed in sleep, loss of concentration, disruption in social & family relationships etc. Overall, excessive use of smartphones can significantly affect the physical, mental, social, emotional, and academic well-being of the students.

The present study reflects that 5.5% students are very highly addicted, 5.5% students are highly addicted, 30.8% are above average, 44% are average level, 29.7% are below average level, and 5.5% are low level of smartphone addiction. More than 40% (38) students are reported to have an above average level of smartphone addiction. This prevalence was higher than previous studies (Davey & Davey, 2014; Kriti Thapa et al., 2020; Mei et al., 2018; Tavakolizadeh et al., 2014) but lower than the one study (Ghosh et al., 2022).

The simple linear regression analysis explains that gender was not a significant predictor of smartphone addiction (β-1.620, R^2- 0.003, F- 0.278, P>0.05). The linear regression also explains that academic streams were significant predictors of smartphone addiction (R^2- 0.185, F- 11.972, P<0.01). Academic streams explain 18.5% variation in smartphone addiction. The results also show that commerce students were having 6.58 lower score in smartphone addiction in as compared to arts students (β- -6.580, t-1.952, P<0.05) and science students were having 11.553 higher score as compared to arts students (β- 11.553, t-3.425, P<0.01).

Variation analysis explains that male and female students cannot be significantly differed in terms of smartphone addiction. The present result is supported by some previous studies (Choliz et al., 2016; Ghosh et al., 2022) and not supported by some studies also (Daei et al., 2019; Domple et al., 2017; Sanchez-Martinezto et al., 2009). The discrepancy between present study and earlier studies may be attributed due to sample characteristics, tools used for data collection, socio-cultural variation, and contextual influence. The participants of the present study mostly belonged to the hosteller who are stayed away from their family. Living in a hostel can promote a sense of autonomy and freedom among the students irrespective of their gender. In this situation, both male and female use their smartphone without any direct control from their parents which may be a cause of smartphone addiction.

The result of the F test shows that there is a significant difference among the arts, commerce, and science students. The mean and SD of arts students is 82.88 & 13.74 respectively, Commerce students are 76.30 & 17.24 respectively, and science students are 94.30 & 13.02 respectively. Multiple comparisons or post-hoc tests were made to know the significant difference between various academic streams via the Turkey method. The mean difference between arts and commerce students is 6.580 which is not significant at 0.05 level. The mean difference between arts and science students is 11.553 which is significant at 0.01 level. Similarly, the mean difference between commerce and science students is 18.133 which is also significant at 0.01 level.

The result of Two-Way ANOVA shows that there is a significant difference between male and female students having arts, commerce, and science academic streams. The F value for the interaction between gender and academic streams is 4.940 and P<0.01.

Conclusion

Smartphone addiction is a growing concern among university students. University students are more vulnerable to smartphone addiction because of several reasons such as individual's choice, independence from family & relatives, interest in making social relationships via social media, communication through online chat, watching

videos etc which can negatively affect their overall development. In this regard, proper rules and regulation should be made by parents, educational institutions, policy makers, and Govt. to regulate the use of smartphones.

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