"ANALYSIS OF SMARTPHONE ADDICTION AND PSYCHOLOGICAL EFFECT ON ADOLESCENTS STUDENTS"

Regeena Chacko
PhD scholar at Arunodaya University, itanagar, Arunachal Pradesh.

ABSTRACT:-

The smartphone has many attractive attributes and characteristics that could make it highly addictive, particularly in adolescents. This study was presented to analyze smartphone addiction and its psychological effect on adolescent students. The data were gathered from the private-aided school of Kottayamin Kerala. A convenience sampling method was used for the analysis of the result. Then, the objective of this study is to examine the predictive factor of smartphone addiction in adolescents. Thereafter, the adolescent's psychological characteristics of smartphone addiction, predictors and addictive level of the smartphone were analyzed and discussed. The result indicated that the adolescent exhibited significantly higher degrees of smartphone dependence and smartphone influence. The anxiety was significantly associated with adolescents' psychological characteristics of smartphone addiction.

KEYWORDS: Adolescents, Smartphone, Social media addiction, Psychological effect, Internet use.

1. INTRODUCTION

Nowadays, smartphone usage is quite prevalent, especially among young people. The functions of smartphones, including providing users with the means of communicating in different environments anytime and fulfilling the tasks typically performed through the computer, have increased the utilization of these technologies (Yildiz Durak, 2019). It becoming indispensable for everyday life and it is estimated that there were 2 billion users across the world in 2012. Almost all adolescents between the ages of 12 and 19 own a smartphone. The number of smartphone users in 2020 is estimated to be 6.1 billion people, which comprises almost 70% of the global population. In addition, the proliferation of smartphone use has led to new industries of application development and mobile marketing (Ting & Chen, 2020)(Cho & Lee, 2017). Smartphones are of benefit to human beings because of their convenience and usability; they also trap people with their "charm" and may further include people to be addicted to them. As a result, problematic behavior such as overuse in the form of Smartphone Addiction (SA) can be induced.

Smartphone addiction is an extension of internet addiction, which may also encompass other forms of behavior bundled through the device, such as gaming, social networking, and online shopping. It is a behavioral pattern of excessive or uncontrollable smartphone use and the experience of adverse withdrawal symptoms, which would result in detrimental psychological and behavioral problems (Noë et al., 2019)(Q. Liu et al., 2020)(Friedrichs et al., 2022). The unfavorable side effects and consequences of smartphone addiction have had on interpersonal relationships, daily activities, a routine of work, and

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our overall physical and mental health. The most vulnerable age groups for developing problematic internet and smartphone use typically are adolescents and young adults (Kiss et al., 2020). Adolescents are at a critical period of behavioral change and their lower levels of self-control and heightened curiosity about new things make them particularly susceptible to problematic internet usage. Indeed, compared to other age groups, they are more likely to be involved in internet-related activities (J. L. Wang et al., 2020). The internal characteristics of smartphone addictionare positively related to negative psychological factors of low life satisfaction, depression, anxiety, aggression, low self-esteem, loneliness, Fear of missing out (FOMO), lethargy, and empathy(Jin Jeong et al., 2020)(Dalvi-Esfahani et al., 2019). The presented research methodology analyzes smartphone addiction and its psychological effect on adolescent students. A well-structured questionnaire survey was conducted to analyze the psychological factors and smartphone addiction of adolescents. The diagrammatic representation of the effect of smartphone addiction was shown in figure 1,
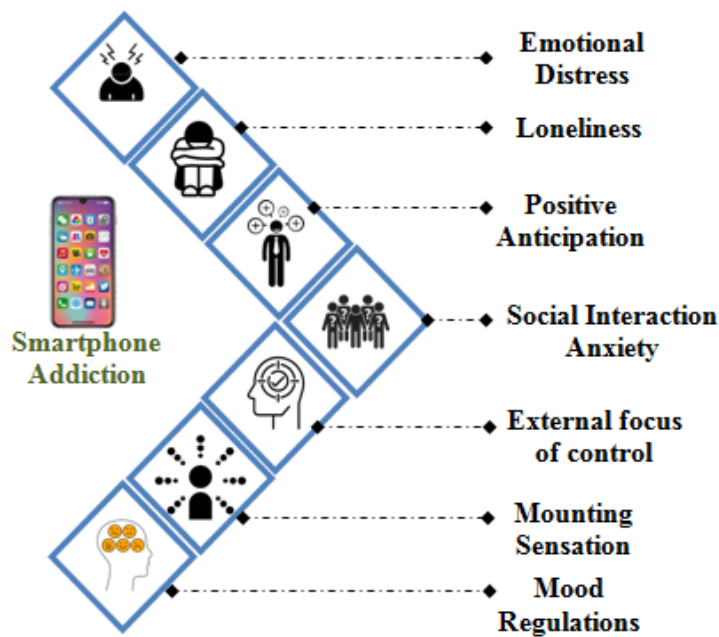

Figure 1: Effect of smartphone addiction

The structure of the presented research work is organized as follows: in section 2, the existing methodologies were explained; in section 3, the presented research methodology is explained; section 4 discussed the results and in section 5, the paper is concluded and the future direction enhancement of the research study is also explained.

2. RELATED WORKS

(Mathew & Krishnan, 2020)intended to assess the level of problematic internet use and self-esteem among adolescents. The samples were gathered in a Private aided school in Kerala among 60 students. Convenient sampling and non-probability were used for the data collection. The result indicated that the Karl-Pearson coefficient had a significant negative correlation between self-esteem and internet addiction, which was r=-0.649 and p<0.001. The result concluded that the use of the internet had a significant impact on adolescents, especially on self-esteem. Certain limitations occurred in this method, with the help of self-report scales, the data had been collected, which might limit the result by adolescents' lack of openness. However, the samples were males, so the findings couldn't be generalized gender-wise.

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(Jamir et al., 2019)examined technology addiction and its correlation among school students in rural India. Here, the data were gathered from the 885 students from four schools in north India. Next, the self-designed questionnaire was utilized to evaluate dependence syndrome. Then, descriptive and logistic regression analyses were utilized for the analysis of the result. Finally, the result concluded that behavioral addiction was more among male students (odds ratio=2.82, 95% CI=1.43, 5.59), use a smartphone (2.77, 1.46-5.26), and those who were depressed (3.64, 2.04-6.49). However, the data on adolescents in terms of dependence was limited.

(Aljomaa et al., 2016)explored the frequency and indices of smartphone addiction among students. The data were gathered from 416 students from King Saud University in Saudi Arabia.The questionnaires were designed and developed for the data collection. A Cronbach's Alpha method was used to establish the internal consistency of questionnaires. The result showed that significant gender differences were found in the degree of addiction. Thereafter, significant differences in hours of daily use were also detected in favor of participants using the smartphone for more than 4 hours a day. The participants of this method were from a particular university in Saudi Arabia, which limits the generalizability of the results to other Middle East regions.

(Kwak et al., 2018)intended to analyze the importance of the relationships with parents, peers, and teachers as the cause of adolescent smartphone addiction and examined the effect of parental neglect on smartphone addiction and the mediating effect of relational maladjustment in school. Data were gathered from the 1170 middle-school students and high schools in four regions of South Korea. Thereafter, by using bootstrapping mediation methods, multiple mediator models were analyzed. Finally, the result indicated thatparental neglect was significantly associated with adolescents' smartphone addiction. However, the sample comprised only Korea, so the generalization of the results was limited.

(Zou et al., 2019)examined the prevalence of hypertension and its association with smartphone addiction among students. Samples were gathered from 2639 junior school students in China. Random cluster sampling was used for the data collection. Next, multivariate logistic regression models were used to seek associations between smartphone addiction and hypertension. The result showed that the poor sleep quality (OR = 4.243, 95% CI: 2.429–7.411), smartphone addiction (OR = 2.205, 95% CI: 1.273– 3.820), and obesity (OR = 4.028, 95% CI: 2.829–5.735) were significantly and independently associated with hypertension. A limitation that occurred in this method was conducting a cross-sectional study, which limits the drawing ofinferences about causation.

(Sun et al., 2019)intended to analyze the mediation effects of emotional intelligence and coping style between child neglect and psychological abuse and smartphone addiction. Data were collected from 1041 Chinese adolescents. A multiple mediation model was used for the analysis of the result. The result concluded that both emotional intelligence and coping style mediated the link between child neglect and psychological abuse and smartphone addiction in a parallel fashion. Thereafter, the emotional intelligence and coping style also sequentially mediated the link between child neglect and psychological abuse, and smartphone addiction. Because of the self-report nature of the questionnaires, the accuracy of individual reports might be influenced by factors such as social desirability.

(Kim & Koh, 2018)explored the structural relationship between avoidant attachment, anxiety, self-esteem, and smartphone addiction in college students. The samples were collected from 313 college students at a large-sized private university in Korea. Next, to test the indirect relationship between avoidant attachment and smartphone addiction through anxiety and self-esteem, a Structural Equation Modeling (SEM) was used. The result showed that the paths between self-esteem and smartphone addiction, anxiety and smartphone addiction, self-esteem and anxiety, and avoidant attachment and self-esteem were statistically significant. However, the result might be differentfrom the other cultural regions or countries.

(Kumcagiz, 2019)intended to examine the quality of life (QL) as a predictor of smartphone addiction risk among Turkish adolescents. Here, the data were collected from a total of 352 high school students in Turkish. Next, to examine the association between QL and smartphone addiction risk, a

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simple and multiple linear regression analysis was used. The result demonstrated that the dimensions of physical and psychosocial health, as well as overall QL, were negatively correlated with smartphone addiction. A limitation that occurred in this method was the utilization of self-report scales, which might lead to some general method biases such as socially desirable and mid-point responding.

(F. Liu et al., 2020)intended to explore the mediating effect of neuroticism and coping style in the relationship between childhood psychological maltreatment and smartphone addiction among college students. The data were collected from 1169 college students in China. Thereafter, to test the hypotheses, a multiple mediation model was used. The result indicated that the mediation analysis showed that both sequentially and parallelly, neuroticism and negative coping styles mediated the relationship between childhood psychological maltreatment and smartphone addiction. However, the causal relationship among the variables couldn't be concluded for the cross-sectional study.

(P. Wang et al., 2018)examined the relationship between sensation seeking and adolescent smartphone addiction and tested both the moderating roles of perceived social support and depression in the relation between sensation seeking and smartphone addiction among adolescents. Samples were gathered from 655 adolescents in China. Thereafter, to examine the moderating effects of perceived social support on the relation between sensation making and smartphone addiction, Hierarchical regression procedures were used. The result showed that sensation-making was positively associated with adolescent smartphone addiction. However, this method was designed based on cross-sectional, so no causality could be inferred.

2.1. Problem statement

School and university students are the age groups who are mostly targeted by communication technologies. They are also mostly interested in using smartphones to which they spend time and dedicated much of their thinking. The competition between smartphone companies to produce low-priced smart devices has led to a significant increase in the number of students possessing smartphones, which in turn increases smartphone addiction among students. Many researchers have investigated smartphone addiction and thepsychological effect on adolescent students, but their existing methodologies have certain gaps,

➢ Most of the existing methodologies were cross-sectional, which does not have generalizability to the results.
➢ The result was generated based on self-reported scales.
➢ The data on adolescents in terms of dependence was limited.

2.2. Variables of the study

Participants completed giving information about their gender, age, class, parents' occupations, and hours of smartphone use by the respondents. The items asked about addictive behaviors and motivation to use a smartphone, and predictive and addictive levels due to smartphone overuse. A higher score indicated a higher level of addiction, which causes problems with smartphone usage.

2.3. Objective of the study

The objective of this study is to examine the predictive factors and addictive level of adolescents' smartphone addiction.

2.4. Hypotheses of the study

H1: There is a significant relationship between smartphone addiction and psychological behaviors.
H2: There is a significant associationbetween predictors and the addictive level of smartphones.

3. RESEARCH METHODOLOGY

The present study is conducted to analyze smartphone addiction and its psychological effects on adolescents. In this study, a methodology adopted is convenience sampling based on well-structured

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questionnaire research. The data were collected from 390 adolescents of 11 to 18 years inaprivate aided school inKottayam in Kerala. The questionnaire was prepared by the 5-point Likert scale.The 5-point Likert scale ranging from "Strongly agree", "Agree", "neutral", "disagree", and "strongly disagree" was used for the analysis. Out of 390 respondents, 356 respondents completed the survey and the remaining 34 students did not properly reply to the structured questions. To analyze the interpretation of the data, simple statistical tools like percentage analysis, mean and standard deviation were used. It gathered information on the addictive behavior and motivation to use smartphones among adolescents were analyzed. Thus, the questionnaire distribution and collection counts are presented in a tabulation format in table 1,

Table 1: Analysis of questionnaire distribution and the respondent collection count

Questionnaire distribution count	Accepted response count	Rejected response count
390	356	34

The research methodology considers the main objectives of analyzing the predictive factors of smartphone addiction among adolescents. A convenience sampling method was used to gather data from the respondents because the respondents diverged in age, gender, grade, etc.

Table 2: Demographic characteristics of the respondents

	Count	Percentage
Gender		
Male	197	55.33%
Female	159	44.66%
Class		
7	56	15.73%
8	59	16.57%
9	57	16.01%
10	62	17.41%
11	58	16.29%
12	64	17.97%
Parents' occupation		
Farmer	21	5.8%
Laborer	162	45.5%
Business	112	31.46%
Service	61	17.13%
Hours of Smartphone used per day		
Upto 1 hour	114	32.02%
Upto 2-3 hours	175	49.15%
4 hours or more	67	18.82%

The details of the respondents given about their gender, class, parent's occupation, and hours of smartphone use per day were shown in the above table.

+ **Gender:**The gender is categorized into male and female. The percentage of male respondents is 55.33 and the percentage of female respondents is 44.66.
+ **Class:** The respondents are from classes 7, 8, 9, 10, 11, and 12. Here, the majority of the students from class 12 (17.97%) and class 7 achieved the least count, the percentage is 15.73%.

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+ **Parents' occupation:** The majority of the respondents were laborers, which is 45.5% followed by business (31.46%), service (17.13%), and farmer (5.8%).
+ **Hours of Smartphone used per day:** The adolescent use of smartphones per day was analyzed. The majority of adolescents used upto 2-3 hours, the percentage is 49.15% followed by upto 1 hour 32.02%, and 18.82% achieved 4 hours or more than 4 hours of smartphone use per day.

3.1. Addictive behavior and motivation use of smartphone

Table 3: Analysis of adolescent's addictive behavior and use of smartphone

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
S1-smartphone use is an important part of my life	113	97	86	44	16
S2-It would be hard for me not to have my smartphone	88	96	81	59	32
S3-To find information instantly	101	123	85	24	23
S4-Using for fun and pleasure	117	104	97	21	17
S5-Finding new people	87	99	75	48	47
S6-My smartphone use prevents me from participating in social activities	83	113	107	40	13
S7-I am busy with my smartphone for more time than I would like to	93	117	67	55	24
S8-My life would be boring and lacking fun without my smartphone	109	114	81	36	16
S9-To obtain the information I need	86	108	93	49	20
S10-To show off to my friends	39	61	93	79	84

Table 3 analyzed the addictive behavior and motivation use of smartphones among adolescents (Zhitomirsky-Geffet & Blau, 2016). Comparing all the statements, most of the respondents strongly agreed to statement 4 which is about using a smartphone for fun and pleasure, the respondents' count is 117, followed by the statement 1(113), S8 (109), S3 (101), S7 (93), S2 (88), S9 (86), S6 (83), and S10 (39). Then, the highest number of respondents agreed to statement 3, which is "To find information instantly", the respondent count is 123. Thereafter, the S7 achieved the second highest position, the respondent count is 117. Next, most of the respondents were selected neutral to statement 6, the respondent count was107, and the S7 (67) obtained the least number of respondents count. The most number of respondents disagreed and strongly disagreedwith the statement; "To show off to my friends" the counts were79, and 84.

4. RESULT AND DISCUSSION
In this section, the data of the collected respondents are analyzed and discussed by descriptive. Here, the psychological characteristics of SA among adolescents were analyzed and discussed. Thereafter, the predictive and addictive levels of smartphone addiction were analyzed.

4.1. Adolescent's psychological characteristics of SA

Table 4: Psychological factors of SA

Psychological	Mean	F(Sig)

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characteristics		
Anxiety	1.67	17.82***
Depression	1.59	14.01***
Aggression	2.46	14.77***
Self-control	3.48	12.36***
Life satisfaction	2.91	8.91***
Lethargy	2.63	12.08***
Annoyance	2.32	8.07***
Others	1.41	2.07*

A statistically significant difference is indicated as * $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$

The above table analyses the adolescent's psychological characteristics of the smartphone. The psychological characteristics of anxiety, depression, aggression, self-control, life satisfaction, lethargy, annoyance, and other characteristics were analyzed, and calculated the mean and sigma values were measured (Jin Jeong et al., 2020). Comparing all the psychological characteristics, the characteristics of self-control achieved the highest mean value, which is 3.48. The characteristics of life satisfaction achieved the second highest mean value, which is 2.91 followed by the characteristics of lethargy (2.63), aggression (2.46), annoyance (2.32), anxiety (1.67), depression (1.59), and others (1.41). The significant value for the psychological characteristics was calculated. Here, the characteristic of anxiety obtained the highest significant factor value, which is 17.82***. The graphical representation of was shown in figure 2,
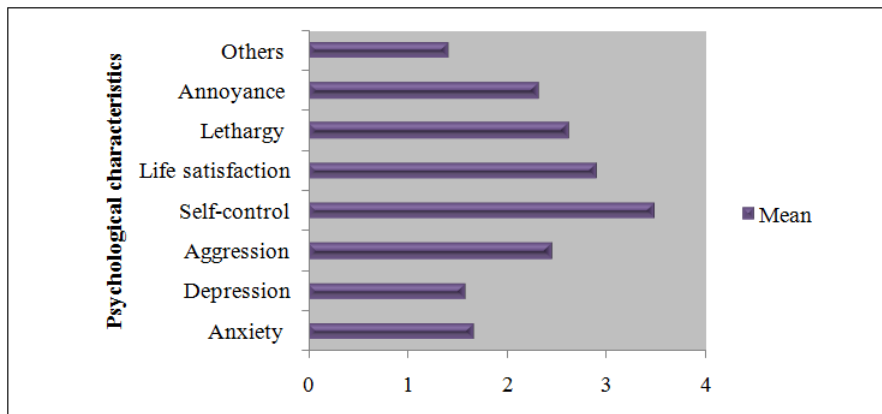

Figure 2: A graphical representation of the mean value of psychological characteristics of SA

4.2. Predictors and addictive level of smartphone

Table 5: Correlation analysis of predictors and addictive level of smartphone

Factor	1	2	3	4	5

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Addictive level	1	0.247**	0.216**	0.488**	-0.316**
Obtaining infotainment		1	0.324**	0.309**	0.211**
Finding new people			1	0.369**	-0.112
Gaining peer acceptance				1	-0.167**
Attachment to family & friends					1

*p < 0.05, **p < 0.01.

The above table analyzed the correlation between predictors and the addictive level of smartphones. The correlation between the variables of addictive level, obtaining infotainment, finding new people, gaining peer acceptance, and attachment to family and friends were analyzed (Lee & Lee, 2017). The addictive level was positively correlated with obtaining infotainment (0.247**), finding new people (0.216**), and gaining peer acceptance (0.488**), whereas it is only negatively correlated to the attachment to family and friends (-0.316**). Next, the factor obtaining infotainment was positively correlated to all the factors. Then, the factor finding new people was positively correlated to gaining peer acceptance (0.369**), whereas it is negatively correlated with attachment to family and friends (-0.112).

5. CONCLUSION

Recently, with the increase in the utilization and popularity of smartphones, adolescent smartphone addiction has become a serious social problem. This research study was intended to analyze smartphone addiction and its psychological effect among adolescents. The samples of the data were gathered from 356 adolescents in a private-aided schoolinKottayam in Kerala. Convenience sampling was used for the analysis of the result. Thereafter, the predictive factors of SA were examined and psychological characteristics were analyzed and discussed. The result of this study concluded that adolescents exhibited significantly higher degrees of smartphone dependence and influence. Most adolescents strongly agreed with using smartphones for fun and pleasure. However, anxiety (17.82***) was significantly associated with adolescent psychological factors of SA. This study implies that the predictors and addictive level of usage should be considered, including strengthening and developinga range of psychological skills and findings other tools to prevent boredom. This study examined the limited number of risk and addictive behaviour, and intention to use smartphone factors in this research and additional studies are needed to explore the other predictive and psychological factors and their role in better understanding smartphone use among adolescents.In the future, the study can be extended by considering more populations and examining all the age groups from various areas in India for the analysis of SA and its psychological effects.

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