



## PSYCHOSOCIAL PREDICTORS OF SMARTPHONE ADDICTION AMONG NIGERIAN UNDERGRADUATES

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**ABSTRACT:** *Smartphone addiction may be seen as a way of coping with underlying psychological distress but the long-term effect of excessive smartphone use is a matter of under-researched public health concern, especially among an at-risk population - university students in Nigeria. This study explored the predictive influence of psychosocial factors - shyness, loneliness, social maladjustment, gender and school-related variables on smartphone addiction among students in selected Nigerian Universities. In this cross-sectional survey, data were collected from 498 undergraduates {255 (51.2%) males and 243 (48.8%) females} with a mean age of participants at 18.30 (SD = 2.03), using psychometrically-robust measures of shyness, loneliness, social maladjustment and smartphone addiction. It was hypothesised that high scores on shyness, loneliness and social maladjustment will be associated with higher levels of smartphone addiction and that school-related variables would significantly influence smartphone addiction among university students. Results indicated a 17.1% prevalence of smartphone addiction among the participants. Results also indicated that loneliness ( $\beta = 0.20$ ;  $t = 4.57$ ;  $p < .05$ ) and social maladjustment ( $\beta = 0.26$ ;  $t = 5.94$ ;  $p < .05$ ) significantly independently predicted smartphones while shyness did not ( $\beta = 0.03$ ;  $t = 0.69$ ;  $p > .05$ ). Jointly, the three variables had a significant prediction of smartphone addiction  $\{F(3,491) = 22.93, adj.R2 = .12, p < .01\}$ . It is recommended that psychologists and school counsellors should be more involved in the emotional well-being of university students. Parents and other stakeholders should help students/children by observing those showing signs of loneliness, shyness and social maladjustment, and engaging them in robust, non-evaluative social interactions with a view to minimising resorting to excessive use of smartphones.*

**KEYWORDS:** Loneliness, Nigerian Undergraduates, Shyness, Smartphone Addiction, Social Maladjustment.



## INTRODUCTION

One of the biggest dividends of scientific advancement and technological breakthroughs in the world is the development of smartphones. Due to their multipurpose functions and capacities to meet a variety of people's needs, smartphone devices have become integral parts of human lives, and have penetrated deeply into people's daily routines (Kuss & Griffiths, 2011). The advent of smartphone technology has facilitated the provision of several services to mankind without the need for physical and social contact with service providers. The smartphone is virtually indispensable to modern living - shopping for different items, ranging from food items, books, and clothing to machines; making friends, finding a route to a geographical location of interest, engaging in dating relationships as well as carrying out financial transactions without stepping into banking hall (Bian & Leung, 2015). Smartphone use is particularly common among students and has been shown to be beneficial in a variety of ways such as in carrying out research, attending virtual classes, taking on assignments, and coordinating groups and classmates ( Lopez-Fernandez, 2015).

The beneficial use of smartphones notwithstanding, there is a growing concern about the excessive use of smartphones and the consequences of such excessive use (Bianchi &Phillips, 2015). Nigeria is ranked among the top 20 countries with high internet users in the world recorded, with an internet penetration ratio of 33.13%. According to the Nigerian Communication Commission (NCC), there are 122 million internet users in Nigeria as of May 2019 out of a population of 180 million people (NCC, 2019). Shambare et al., (2012) in Al-barashdi, Bouazza1 and Jabur (2016) described the mobile phone as the 21<sup>st</sup> century's icon as well as possibly the biggest non-drug addiction.

Casey (2012) highlighted five uniquely associated symptoms of addiction: disregard of harmful consequences, preoccupation, inability to control craving, productivity loss and feeling anxious and lost with Smartphone use among university students in mainland China. Yen et al., (2009) have also established that obtaining at least four of seven symptoms such as withdrawal, tolerance, and use for a longer period than intended, is indicative of problematic smartphone use. Further studies have indicated that excessive use of smartphones can lead to functional impairment and maladaptive behavioural difficulties similar to what is found in pathological gambling, and alcohol/drug addiction (Kuss& Griffiths, 2011). Smartphone addiction can also impair academic ability, limit real-life social interaction, and interpersonal relationships (Kuss& Griffiths, 2011; Sim& Kim, 2011 cited in Akpunne and Akinnawo, 2018) and cause physical health-related problems including blurred vision and pain in the wrists or the back of the neck (Kwon et al., 2013). There also exists a positive relationship between smartphone addiction and health-compromising behaviours (Leenaa et al., 2005), sleep disturbances and depressive symptoms (Thome´e et al., 2011 cited in Bian & Leung 2015) as well as depression, anxiety and distress (Boumosleh & Jaalouk, 2017).

Previous research has highlighted the contribution of psychosocial variables in the emergence and maintenance of smartphone addiction in young people (Casey, 2012, Al-barashdi et al., 2016). For instance, the effect of being shy, lonely and socially maladjusted has been found to be overwhelming for growing adults (Casey, 2012, Bian & Leung, 2015). Young adulthood is supposed to be a period of increased social interaction and connectedness, but individuals with underlying psychosocial problems like loneliness, shyness and social maladjustment may find this period overwhelming and the demand of social interaction too burdensome compared to



their counterparts due to an internalised idea of social alienation, distancing and maladaptive assumption of isolation from significant others (Casey, 2012, Arogundade & Amure, 2015).

Bianchi and Phillips (2005) reported that smartphones addicts use smartphones to escape from problems and emergencies; hide their actual use from family and friends (who had at one time or other complained about the excessive use of smartphones); face financial crises because of excessive use of mobile phones; feel preoccupied, anxious, or depressed when out of reception range for some time; and continuously fail to control or cut back mobile phone use. Other research has investigated smartphone addiction from the perspectives of leisure, boredom, sensation seeking, and self-esteem (Leung, 2008).

Loneliness is a perception of social distancing and feelings of discrepancies between desired physical interactions and achieved levels of social contact. Vasileiou, Barnett, Barreto, Vines, Atkinson, Long, Bakewell, Lawson, & Wilson, (2019) stated that young people also present a significant risk of elevated levels of loneliness. Being lonely and shy has been found to exacerbate the tendency of spending more time with one's smartphone in order to avoid the stress and anxiety of face-to-face interactions (Myers, 2013; Casey, 2012). It is also possible that smartphones, unlike regular mobile phones, provide lonely and shy people with a perfect environment to alleviate loneliness and shyness. According to Myers (2013), loneliness is "a self-perceived state that a person's network of relationships is either smaller or less satisfying than desired", and shyness is a "discomfort and inhibition that may occur in the presence of others". Loneliness and shyness were considered to be a measure of a lack of "social connectedness", a term defined as a lack of "interpersonal, community, and general social ties" (Myers, 2013). Lonely and shy people engaged in different activities, like playing online games, taking photos and videos, searching for news, texting a friend, and reading a book on their smartphones (Bian & Leung, 2015). Interaction with their smartphones reduces the emotional turmoil of feeling shy and lonely by curtailing the frequent need to maintain eye contact, and other 'nonverbal cues' (e.g., facial expression and gestures) with others, as it involves less control of the disclosure and interpretation of social cues (Bian & Leung, 2015).

Loneliness has been found to be significantly associated with internet addiction. Engelberg and Sjoberg (2004) found that people that are lonely exhibit poorer social skills and use the Internet more frequently. When it comes to mobile communication, the basic purpose of the mobile phone is to allow people in two different places to communicate instantly, eliminating the primary human anxiety about loneliness (Townsend, 2000). Thus, it is reasonable to believe that lonely people might tend to use their smartphones to connect to the internet, play games, text, and chat more than other people to get rid of this kind of anxiety. Park (2005) also found that loneliness is positively correlated with mobile phone addiction among college students.

Social maladjustment from the psychiatric perspective is described as a behaviour indicating failure of the individual's adaptive capacity. In other words, social maladjustment is a type of adjustment disorder which is a maladaptive reaction to a psychosocial stressor (Arogundade & Amure, 2015). Social maladjustment is described as the inability of the individual to develop a satisfying relationship, a lack of social finesse or a breakdown in maintaining constructive social relationships (Lopes et al., 2005). Few studies have investigated the direct relationship between social maladjustment and smartphone addiction. Findings from studies that have examined social maladjustment as a predictor of psychopathology indicated that social maladjustment was associated with greater suicidal ideation (Resrepo et al., 2016) and problematic use of new technologies (Resrepo et al., 2016; Amendola et al., 2019).



Shyness is described as a temperament that is characterised by being too suspicious and apprehensive of perceived social evaluation, reticence in social situations, and embarrassment as well as being too self-conscious in situations that involved meeting new people or even familiar faces (Spensieri et al., 2019) and a lack of confidence in meeting people and feeling uncomfortable in the presence of others (Bian & Leung, 2015). In recent years, there has been a growing interest in the study of personal characteristics, such as shyness, which may predispose adolescents to the development of cognitive and behavioural patterns related to problematic smartphone use (Casale & Fioravanti, 2011).

Shy people tend to regard their networks as less supportive and less satisfying and are happy and more comfortable being by themselves (Parrott, 2000) as well as being engrossed with their smartphones. Bian and Leung (2015) found that shyness is related to problematic drug and alcohol use both in adolescence and adulthood. Other empirical evidence suggests that deviant internet use is significantly correlated to shyness (Caplan, 2002; Oforu, 1999). However, Wei and Lo (2006) found that shyness was negatively associated with motivation and frequency of mobile phone use. The plethora of functions of smartphone devices provide avenues for people to avoid communicating with others face-to-face or even by voice; thus, this may be a preferred way for shy people to communicate with others. In addition, other functions of smartphones, which give people access to entertainment like games or allow people to get information by surfing on the internet, help shy people to escape from uncomfortable situations while in public and indulge in a virtual, private mobile computing environment.

Empirical evidence is scanty with regard to the association between school-related factors and smartphone addiction. However, Oliver (2005) found that business students used mobile phones more extensively in their courses, compared to core science students. Abu-Jedy (2008) investigated addiction to mobile phones and its relationship with self-disclosure among a sample of students selected from the university of Jordan and Amman Al-Ahliyya University. It was found that there was a significant difference in terms of addiction related to the student's field of study Abu-Jedy (2008). Specifically, humanities students had higher levels of addiction than natural sciences students. Also, there was a higher level of addiction among private university students than among public university ones. Empirical evidence is scanty with regards to the influence of the level of study in the university on smartphone addiction, Al-barashdi et al., (2016), however, opined that the need to connect to the internet for social networking, research materials for term papers /projects, shopping, as well as betting/gaming increases with a period spent in the university.

Staying connected with one's devices may be assumed to be a way to cope with the underlying psychological distress of feeling shy, lonely and lacking adequate social adjustment capacity for social interactions. Excessive use of smartphones may temporarily relieve the anxiety of being shy, lonely and socially maladjusted among these people but the long-term damage which may result from being addicted to the smartphone is a matter of concern. The study is aimed at investigating the predictive influence of psychosocial factors (shyness, loneliness, social maladjustment, gender and school-related variables) on smartphone addiction among students in selected Nigerian Universities. Specifically, we hypothesised that high scores on shyness, loneliness and social maladjustment will be associated with higher levels of smartphone addiction. We also hypothesised that there would be a greater likelihood of smartphone addiction among female students relative to their male counterparts. Finally, we



hypothesised that school-related variables (type of university, course of study and level of study) would significantly influence smartphone addiction among university students.

## MATERIALS AND METHODS

### *Participants / Setting*

Four hundred and ninety-eight undergraduate students, aged 18 years and above, participated in this cross-sectional survey. The study setting was in Osun State Nigeria. Osun State has a total of nine universities, two are owned by the government while seven are privately owned. A purposive sampling technique was used in selecting the two institutions – one a government-owned university and the other a Private university – both located in Osun State, Southwest Nigeria. Osun State University (UniOsun), established by the Government of Osun State in 2005, has its main campus in Osogbo with five satellite campuses distributed across the five administrative/geopolitical zones in Okuku, Ipetu-Ijesha, Ikire, Ifetedo; and Ejigbo. Redeemer's University (RUN) is a private institution owned by the Redeemed Christian Church of God. The University started at the Redemption Camp, Mowe, in 2005 before moving to its permanent site in Ede, Nigeria in 2014.

Participants were selected across the faculties, departments, and levels of study and sex using a purposive sampling technique. Of the 498 participants, 272 (54.6%) were from UniOsun and 226 (45.4%) from RUN. The participants' mean age was 18.30(SD = 2.03) years. In terms of gender, 255(51.2%) of the participants were males while 243 (48.8%) were females. Distribution according to levels of study showed that 239 (48.0%) of the participants are in the first year (100 level) of study, 115 (22.9%) are in the second year (200 level) of study and 144 (29.1%) are in the third year (300 level) of study. With regards to the course of study, 135 (27.0) of the participants were in the Arts / Humanities and Law disciplines, 196 (39.6) 48.9% were in the Management/Social Sciences and 167 (33.4) were in the Basic Medical / Natural Sciences.

### *Measures*

Relevant data were collected using a five-sectioned questionnaire that consisted of validated and widely-used psychological instruments. The first section of the questionnaire assessed participants' background / socio-demographic information such as age, sex, name of the university, course/faculty of study, and level of study.

Loneliness was assessed using the *University of California Loneliness Scale (UCLA-LS)*. The UCLA-LS is a 20-item scale designed by Russell, Peplau and Cutrona (1980) to measure peoples' subjective feelings of loneliness as well as feelings of social isolation. The UCLA-LS is a self-report instrument comprising 20 items scored along a five-point Likert scale with options ranging from Strongly Disagree (1) to Strongly Agree (5) and with higher scores indicating more loneliness. Of the 20 items on the scale, 10 are directly scored while the other 10 are reversed scored. The scale has been widely used by researchers and clinicians and its validity and reliability have been reported (Demir, 1989). The reliability coefficient of the scale was reported to be as high as 0.96 (Demir, 1989). In the present study, a coefficient alpha of 0.74 was obtained for the scale.



*Smartphone Addiction Scale-Short Version (SAS-SV)*, developed by Kwon et al.,(2013), was used to assess smartphone addiction. The SAS-SV, a revised version of the Smartphone Addiction Scale, examines the extent to which people are hooked to smartphones and yields a total score that is indicative of the severity of smartphone addiction. The SAS-SV is scored on a six-point Likert scale ranging from “Strongly disagree” (1), “Disagree” (2), “Weakly disagree” (3), “Weakly agree” (4), “Agree” (5), and “Strongly agree” (6), and with higher scores indicating more severe addictions across the six factors of smartphone addiction (daily-life-disturbance, positive-anticipation, withdrawal, overuse, tolerance, and cyberspace-oriented relationship). Participants’ composite scores are used to assess their levels of smartphone addiction with cut-off values of 31 and 33 for males and females respectively (Kwon et al., 2013). A score higher than the cut-off value is indicative of a high risk of smartphone addiction. A Cronbach’s alpha of 0.87 was obtained for the scale in the present study.

*Social Maladjustment Scale (SMS)* was developed by Wiggins (1969) and was used to assess social maladjustment in this study. The 27-item inventory was designed to measure social maladjustment along three dimensions - inadequate interaction, shyness and a tendency to be reserved or reticent. The scale is scored along a five-point Likert scale with options ranging from Strongly Disagree (1) to Strongly Agree (5) and with higher scores indicating more social maladjustment. The scale has been shown to possess adequate psychometric properties (Arogundade&Amure 2015, Akpunne et al., 2020). A Cronbach alpha of .83 was obtained for the scale in the present study.

*The revised Cheek and Buss Shyness Scale (RCBSS 14-item)* was developed by Cheeks and Briggs (1990). Participants are to indicate how certain statements are characteristic or true of their feelings and behaviour on a 5-point scale ranging from “Very uncharacteristic or untrue” (1), “Uncharacteristic” (2), “Neutral” (3), “Characteristic” (4), “Very characteristic or true” (5). While 10 items on the scale are directly scored, 4 items are reversed. They displayed adequate internal consistency ( $\alpha = .90$ ).

### **Procedure**

Data collection was undertaken by the researchers and two colleagues over a three-week period during which the questionnaire was personally administered to 525 participants but 498 were returned with usable data, thus yielding a 94% return rate. Two-stage sampling approach was employed. Using stratified sampling, the population units were divided into government and privately-owned institutions, and then two institutions (a government and privately owned institutions) which were at close distance to the researcher were selected using purposive sampling. Participants were as well selected purposively across the faculties/departments and levels of the participants. The administration of the questionnaires was carried out by the researcher with the help of his colleagues in liaison with secretaries of the participants' departmental offices. Permission to recruit participants was sought through the Dean of their faculties. Consent was assumed at the point of collection of the questionnaire after they had been briefed on the objective of the study. Participants were told of their voluntary participation and that they could discontinue their involvement at any time. Anonymity and confidentiality of responses were also conveyed. Since the questionnaire is self-administered, participants had the option of either returning the questionnaire immediately or dropping it at their departmental office for later collection by the researcher.



## Data Analysis

Descriptive statistics including percentages, mean and standard deviation were performed as initial analyses to throw light on the prevalence of loneliness, shyness, social maladjustment and smartphone addiction. Linear multiple regression analyses were performed to explore the predictive influence of loneliness, shyness, and social maladjustment on smartphone addiction.

**Conflict of Interest:** There are no conflicts of interest concerning this study.

## RESULTS

As an initial step, we explored the patterns of loneliness, shyness, social maladjustment and smartphone addiction. Results, using the cut-off values of the various measures indicated that 11.8% of participants scored low on loneliness, 70.1% had scores reflecting moderate loneliness and 18.1% reported high loneliness. On shyness, 13.1%, 67.6% and 18.9% of participants had low, moderate and high shyness respectively. On social maladjustment, 16.7%, 66.0% and 17.3% reported low, moderate and high social maladjustment respectively. Results further indicated that 16.1% reported low smartphone addiction, 66.8 reported a moderate level and 17.1 reported a high level of smartphone addiction.

To investigate the predictive influence of loneliness, shyness, and social maladjustment on smartphone addiction, linear multiple regression analyses were performed. Results indicated, as shown in Table 1, that loneliness is significantly associated with smartphone addiction ( $\beta = 0.20$ ;  $t = 4.57$ ;  $p < .05$ ). This means that the more lonely a student is, the greater the likelihood of smartphone addiction. Findings also indicated that social maladjustment is associated with smartphone addiction ( $\beta = 0.26$ ;  $t = 5.94$ ;  $p < .05$ ) with more social maladjustment indicative of more smartphone addiction. Shyness did not have an independent prediction of smartphone addiction ( $\beta = 0.03$ ;  $t = 0.69$ ;  $p > .05$ ).

With regards to the joint prediction, results indicated that there was a significant joint prediction of smartphone addiction by loneliness, shyness, and social maladjustment ( $F_{(3,491)} = 22.93$ ,  $adj.R^2 = .12$ ,  $p < .01$ ), with the three variables accounting for 12% of the observed variances in students' smartphone addiction.

**Table 1: Results of the Multiple Regression Analyses by Loneliness, Shyness, and Social Maladjustment**

Variable	<i>t</i>	$\beta$	<i>p</i>	<i>F</i>	<i>p</i>	<i>adj.R</i> <sup>2</sup>
Loneliness	4.57	.20	.01	22.93	.00	.12
Shyness	0.69	.03	.49			
Social Maladjustment	5.94	.26	.01			

Results, as shown in Table 2, indicated that there was no significant influence of sex on smartphone addiction ( $t(498) = .50$ ,  $p > .05$ ). The mean scores of male and female participants were 30.88 (SD = 11.32) and 30.38 (SD = 11.10) respectively. The hypothesis which suggested significant sex differences in smartphone addiction is, therefore, rejected.



**Table 2: Independent t-test showing the influence of sex and type of school on smartphone addiction**

Variable	Source	n	M	SD	df	T	P
Sex	Male	255	30.88	11.32	498	.50	.62
	Female	242	30.38	11.10			
Type of University	Public	273	30.98	11.62	498	.74	.42
	Private	225	30.22	10.69			

Results further showed (Table 2) that there was no significant influence of the type of school/university on smartphone addiction  $\{t(498) = .74, p > .05\}$ . The mean score of students from public universities was 30.98 (SD = 11.62) while the mean score of participants from private universities was 30.22 (10.69). The hypothesis which suggested a significant influence of school type on smartphone addiction is, therefore, rejected.

Univariate analysis of variance or one-way analysis of variance (ANOVA) was performed to determine the influence of the level of study on smartphone addiction. Results showed that the level of study in the university had a significant influence on smartphone addiction  $\{F(2,494) = 9.10, p = .00\}$ . As presented in Table 3, participants in their first year in the university (100 level) reported the least level of smartphone addiction (M = 24.74, SD = 10.78) than participants in their second year (M = 30.75, SD = 9.53) and third year in the university (M = 33.69, SD = 12.44). Results of post hoc analyses showed these differences to be statistically significant.

**Table 3: One ANOVA of Level of study on Smartphone Addiction**

Source	Sum of Squares	df	Mean Square	F	P
Between Groups	2211.01	2	1105.51	9.09	.00
Within Groups	60078.07	494	121.62		
Total	62289.08	496			

To determine the influence of course of study/discipline on smartphone addiction, a one-way ANOVA was performed (Table 4). Results indicated a significant influence of the course of study on smartphone addiction  $\{F(2,494) = 3.52, p = .05\}$ . Participants in Faculties of Basic/Natural Sciences (M = 29.4, SD = 11.21) and Faculties of Humanities/Law (M = 29.8, SD = 11.41) reported significantly lower on smartphone addiction than participants from Faculties of Social/Management Sciences (M = 32.3, SD = 10.90). This showed that smartphone addiction is relatively more prevalent in participants from the Faculties of Social and Management Sciences than in other faculties.



**Table 4: One-way ANOVA of influence of faculty/discipline on smartphone addiction**

<i>Source</i>	<i>Sum of Squares</i>	<i>df</i>	<i>Mean square</i>	<i>F</i>	<i>Sig.</i>
Between Groups	875.213	2	437.606		
Within Groups	61413.870	494	124.320	3.520	.030
Total	62289.082	496			

## DISCUSSION

The present study investigated psychological and school-related factors that can influence smartphone addiction among Nigerian undergraduates. We found that psychological variables of study (loneliness, shyness and social maladjustment) significantly predict smartphone addiction. This finding is consistent with those of Park (2005) and Casey (2012) in which loneliness and smartphone addiction were found to be positively correlated among participants in Korea and Mainland China respectively. In a similar vein, Bian and Leung (2015) reported that psychological attributes such as shyness and loneliness predicted patterns of smartphone usage and addiction among university students in China. They further identified symptoms of smartphone addiction to include disregard of harmful consequences, preoccupation, inability to control craving, productivity loss, and feeling anxious and lost. The findings of this study also appear to corroborate previous empirical evidence with regard to the link between social maladjustment and psychopathological symptoms generally (Resrepo et al., 2016) and problematic use of new technologies (Amendola et al., 2019; Resrepo et al., 2016).

As opined by researchers (e. g. Amendola et al., 2019; Bian& Leung, 2015; Casey, 2012; Park, 2005; Restrepo et al., 2016) and based on the findings of the present study, we are also persuaded that smartphone addiction could be seen as a defence mechanism - a way of coping with or avoiding pervasive underlying emotional issues. In as much as excessive preoccupation with smartphones offers a reprieve for smartphone-addicted individuals from subjective fears, anxieties and worries that are perceived to be associated with face-to-face social interaction by many shy, lonely and socially maladjusted individuals, smartphone addiction represents an escape behaviour and carries the potential to be reinforced consistently, especially with the arrays of pleasant and psychologically-rewarding experiences of visiting certain sites and using certain applications that are now available on smartphones.

This study found a significant influence of some school-related factors on smartphone addiction. With regards to faculty/discipline of study, participants from the Social Sciences and Arts were found to have higher smartphone addiction compared to their counterparts in the faculties of sciences (Basic Medical and Natural Sciences). This finding is consistent with those of previous studies (e.g. Abu-Jedy, 2008; Al-barashdi et al., 2016) and may be due to the relatively heavier load of laboratory work that students in the science-oriented disciplines are exposed to, which may reduce their use of smartphones than students in the Arts and Social Sciences disciplines whose study activities require a lot of searches for materials online.

Interestingly, results indicated first-year students had lower levels of smartphone addiction than their counterparts in upper levels in the university. This result implies that excessive use of the smartphone tends to increase as the students move from an academic level to the next upper one. Although we found no empirical support for this finding, it is plausible to opine that the observed elevated scores on smartphone addiction by higher-level students may be a result of



the increased need to use smartphones for academic activities as one moves higher in the university. It is also possible that the need to connect to the internet for social networking, research materials for term papers/projects, shopping, as well as betting/gaming increases in the upper class than at the entry-level into the university (Al-barashdi et al., 2016).

Based on the findings of this study and discussion of the same, we conclude as follows: First, with over 83% of participants reporting moderate or high levels of smartphone addiction, there is a high incidence of smartphone addiction among students from selected universities in Southwest Nigeria. Second, higher levels of loneliness and social maladjustment are associated with more smartphone addiction. Lonely and socially-maladjusted students use smartphones excessively to cope with or avoid facing pervasive underlying emotional issues. Third, discipline/course of study has an influence on smartphone addiction among students. Specifically, students in the social sciences and management sciences are more likely to be addicted to smartphones than their core science-based counterparts. Fourth, the tendency for smartphone addiction increases with increasing levels of study, with first-year students least likely to be smartphone addicted. Finally, there was neither a significant gender-related influence nor school-type influence on smartphone addiction among students. These imply that the problem cuts across gender and school type.

Given the various psychological and other deleterious effects that have been associated with smartphone addiction, especially among young persons, it is recommended that psychologists and school counsellors should be more involved in the emotional well-being of university students. Parents and other stakeholders should help students/children by observing those showing signs of loneliness, shyness and social maladjustment, and engaging them in robust, non-evaluative social interactions with a view to minimising resorting to excessive use of smartphones.

Students, especially those in the social science/management disciplines and those in the higher levels of their studies, should be targeted for relevant psychological intervention such as psycho-education in which the various negative issues surrounding the unhealthy use of smartphones are highlighted. Prevention and intervention strategies based on a multi-level strategy should be adopted by health providers in managing the effect of psychological factors such as loneliness, shyness and social maladjustment among students in the universities. These strategies could reduce the excess time that students spend with their phones. Training such as social skills and emotional intelligence can be implemented to provide leverage for the socially-withdrawn students to engage in physical/face-to-face interaction more. Also, university authorities should employ the services of qualified psychologists for the provision of psychological health services to help in combating the negative impact of loneliness, shyness and social maladjustment on university students.

The present study, being a survey in which self-reports were relied upon in data collection, is prone to certain limitations which imply that generalisation of the findings should be done with caution. An experimental study in which variables were actively manipulated and the various study conditions properly controlled would have provided a more compelling test of the hypotheses. Also, since only two universities were selected from Osun State in Southwestern Nigeria (although the two universities are adequately representative of the Southwest), generalisability to the entire country would be inappropriate, and thus, constitutes a limitation. The aforementioned notwithstanding, we are persuaded that the limitations are not sufficiently potent to vitiate the findings and conclusions of this study.



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