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ORIGINAL RESEARCH

Age and gender demographics in social media use, Smartphone addiction and psychological morbidity among university undergraduates in Southwest Nigeria

Afe TO*, Ogunsemi OO, Osalusi BS, Adeleye OO, Ale AO

Department of Medicine and Psychiatry, Olabisi Onabanjo University, Sagamu, Ogun State, Nigeria

***Correspondence: Dr. TO Afe, Department of Medicine and Psychiatry, Olabisi Onabanjo University, Sagamu, Ogun State, Nigeria. Email: afeet23@yahoo.co.uk; ORCID: https://orcid.org/0000-0003-2757-367x.**

Abstract

Background: Smartphone addiction has become a public health issue. The use of social media has led to unintended consequences, especially among young adults and college students. Unfortunately, the pattern of use, the prevalence of addiction and the relationship with actual psychological morbidity are not clear.
Objective: To evaluate the prevalence of Smartphone addiction and the relationship to the frequency of social media use and psychological morbidity among Nigerian university students.
Method: One hundred and fifty-nine students were recruited through social media invites and direct invitation from Lecture Halls. The socio-demographic forms, the Smartphone Addiction Scale (Short Version) and Self-reporting Questionnaire-20 were administered.
Results: WhatsApp was the most frequently accessed social media phone application (62.9%).Participants who used Instagram had the highest mean score on SAS-SV (31.4±9.4) and SRQ-20 (8.1±5.3). The prevalence of Smartphone addiction was 34.6% (55/159) while 48.4% (77/159) met the criteria for psychological morbidity. A higher proportion of males met the criteria for Smartphone addiction (29; 50.8%). Males had higher mean SAS scores (31.7±9.4) compared to the females (28.1±8.5) ($p = 0.01$). Smartphone addiction was more frequently associated with psychological morbidity among males ($p = 0.01$). No significant difference in Smartphone addiction and psychological morbidity was found across ages.
Conclusion: Smartphone addiction is prevalent and associated with psychological morbidity among male undergraduates. There is a need to direct interventions at curbing its prevalence among undergraduates.

Keywords: Addiction, Age, Gender, Social media, Smartphones.

Introduction

A major technological innovation in the 20thcentury was the development of smartphones. This impressive technology has become woven into the fabric of daily activities. The technology has significantly impacted on communication, entertainment, information gathering, and connections. From the rudimentary beginnings in the nineties, today's smartphones have become a must-have in the modern society. [1] Smartphones are appropriately called 'smart' because they function like handheld computers due to the speed at which information is processed and the applications which interact with the user on a personalized and convenient level. [2] Smartphones have become versatile and

adaptable to daily activities due to their mobile nature, size, touch screens, attractive designs, computer-based applications, and social connectivity. [3]

Studies in the US have shown that a sizeable proportion of users (46%) feel that they cannot live without them. [4] Indeed, smartphone usage has reshaped social communication and given birth to a new social culture. [5,6] About 2.7 billion people in the world use smartphones and it is projected to reach 2.87 billion by the year 2020. [7] Apart from communication, smartphones have been used for business, leisure, relief of stress and seeking relationships. [8] These attractive functionalities have made it the desired technology, appealing to the users in every age category. Particularly, smartphones appeal more to young adults and teens hence, they make up a larger percentage of users worldwide. A recent survey in the United States of America reported that over 95% of teens own smartphones. [9] Among many young adults and teens, the ownership of smartphones confers a status symbol and exhilarating feel of belonging to social circles and groups. Smartphones serve a veritable tool for socially shy teenagers to express themselves in social circles. In many instances, smartphones have preloaded social media applications that enable users to connect easily to social media platforms such as Facebook, WhatsApp, and Snapchat. In most cases, social groups are formed on these social media platforms and smartphones enable easy and daily conversations even while working.

Regardless of the exciting appeal of smartphones to youths, concerns have been raised over its health and behavioural consequences. Some of the physical health consequences include increased risk of motor accidents and neck pains. [10] More often, complaints about obsessive smartphone use and neglect of other important activities have been increasing. Noticeably, many users have become so preoccupied with their smartphones and that preoccupation overrides any other pleasure-seeking alternatives. These behaviours, akin to substance dependence, have been documented among those who are attached to their smartphones. Similar behavioural addictions towards similar technology were reported among internet users over a decade ago. [11] The concept of internet addiction has been formalized as a diagnostic entity in DSM-V. [12] While internet addiction refers to an addiction to internet use via any means, Smartphone addiction refers to behavioural addictions to the use of smartphones. The ease and frequency of these behaviours have led to Smartphone addiction gaining currency as an emerging concept. [13] Smartphone addiction is the rubric given to behaviours resulting from dependence and obsessive use of smartphones.

The concept is still rudimentary and the criteria for diagnosis have been loosely adapted from the DSM-V criteria for internet addiction. [12,15] The criteria revolve around four main components: compulsive behaviour, tolerance, withdrawal, and functional impairment. [13] It bears similarity to substance addiction, behaviours. [13] Unlike substance use, smartphone addiction may not have direct physical effects but the psychological effects are similar. [14] Some surveys conducted in different countries have reported varying prevalence rates among various teens and adolescents. In Switzerland, 16.9% of 1519 surveyed met the criteria for Smartphone addiction. [10] In a study conducted among university students in Saudi-Arabia, the prevalence rate was reported as 48%. [14]
In Nigeria, like other developing countries, the rate of Smartphone use is rising among adolescents and young adults. Currently, Nigeria ranks as one where the highest mobile phone users in the world with an estimated 36 million users. [16]

Few studies have explored Smartphone addiction in Nigeria. A recent study of university students in Benin, Nigeria, reported

that 93.9% of those who were aware of smartphone addiction met the criteria for addiction, while 6.1% of those who were unaware of addiction met the criteria for addiction. [17]

However, though the field of smartphone addiction is still evolving and the demographic variables that are most at risk remain debatable. Specifically, data shows that young adults are the most vulnerable. Additionally, the relationship between Smartphone addiction and associated psychological morbidity remains unknown. Therefore, the mental health consequences have not received much attention. It remains a debate as to the true psychological impact or consequences of smartphone addiction on people concerning age and gender differences. Objectively assessing psychological morbidity and the relationship with Smartphone addiction will help mental health experts to determine a basis for offering therapy to those who meet the criteria for smartphone addiction. The present study aimed to assess smartphone addiction in relation to psychological morbidity concerning age and gender among undergraduates who are part of the vulnerable group.

Methods

Participants

The study participants were undergraduates of Olabisi Onabanjo University, Ogun State, Nigeria, a major state-owned university in southwest Nigeria. The minimum sample size was determined as follows:

$N = z^2 pq/d^2$

Where z = Standard normal deviates, usually set at a confidence level of 1.96, at $\alpha = 0.05$.

p = Known prevalence of 48% previously reported in Saudi Arabia.

q = 1-p, and

d = the degree of accuracy set at 0.05.

The calculated minimum sample size was 260 inclusive of 10% of attrition.

Students from all levels of study in different faculties in the university were recruited into the study. The students were invited to participate in the study through WhatsApp platforms formed by various department-based student groups and through attendance at the mandatory General Studies lectures. Copies of the socio-demographic forms and questionnaires used for the study were sent to the participants recruited via online platforms by email. Hard copies of the research tools were given to students who were recruited via the classroom, A total of 275 were recruited through the various platforms and this formed the sampling frame. In all, 203 students were contacted, 23 declined due to non-use of smartphones, 21 missed out important information such as age, sex, and other socio-demographic information and were excluded. One hundred and fifty-nine questionnaires were valid for statistical analysis. These were from the Faculties of Art, Social sciences, Law, Clinical Sciences, Basic Medical Sciences, Education, Agriculture, and Sciences. Faculty of Engineering was excluded due to logistic challenges. The study was conducted with strict consideration for ethical principles on human research according to Helsinki's Declaration. The ethical approval for this study was covered by the approval for a larger study (OOUTH/HREC /273/2019AP).

Research materials

A purposely designed socio-demographic form was used to capture data such as age, gender, level of study, department, use of social media and self-report of addiction.

Smartphone Addiction Scale -Short version (SAS-SV) (Appendix A)

This tool was developed by Kohm, *et al.* [18] It was developed from the larger 33-item Smartphone addiction scale. [18]The scale contains 10 items measured on a 6- point Likert scale from Strongly disagree to Strongly agree with scores ranging from 1 to 6. The total scores range from 10 to 60. The psychometric properties of the tool were assessed to have satisfactory reliability

(Cronbach alpha=0.91. [18] This tool has previously been used in Nigeria. [17] Besides, the questionnaire was previously pretested and adapted in a previous study in Nigeria. [17] On face validity, the areas covered were similar to the DSM-V criteria for internet addiction. The cut-off scores for males and females were 31 and 33 respectively.

Self-Reporting Questionnaire-20 (Appendix B)

Self-Reporting Questionnaire (SRQ) was developed by the World Health Organisation (WHO) for screening for common mental disorders at the primary health care level. The Self-Reporting Questionnaire -20 contains 20 items, a subset of the larger SRQ-25. The SRQ-20 focuses on neurotic features excluding the five items which focus on psychotic features and seizures. The SRQ-20 covers common areas of morbidity which include depression, somatic complaints, and anxiety. [19, 20] Each item is scored on a "Yes" or "No" basis with a "Yes" response scored "1" and a "No" response is scored "0". The cut-off scores in this tool vary in cultures and societies. [19] For the present study, a cut-off score of 7 and above was adopted as previously used in similar cultures. [21]

Data Analysis

The data were analyzed using Statistical Package for Social Sciences version 21. Descriptive statistics such as frequencies and means with standard deviations were used to describe age and gender distribution. The mean scores on each item on the SAS-SV short version were determined. The Chi-Squared test was used to compare proportions of Smartphone addiction scores on SAS-SV scores and Scores on SRQ-20 scores along with age and gender lines. The Independence t-test and One-Way ANOVA test were used to compare means of SAS-SV scores and SRQ-20 scores across age and gender. The level of statistical significance was set at $p<0.05$.

Results

Socio-demographic Characteristics

Out of the 203 students that were contacted for the survey, only 159 completed the questionnaire. The age ranged from 17 to 40 years. The mean age of the participants was 21.5±4.0 years. More than half (83; 52.2%) were within the 17-20 years group while 47.8% (76/59) were within the 21-40 years group. Females constituted 64.2% of the participants with a mean age of 20.9±4.0 years while the males formed 35.8% with a mean age of 23.5±5.0 years. The majority of the participants were in their first and second year of study (104; 65.4%) as shown in Table I.

Frequency of social media use on smartphones

The WhatsApp was the most frequently used social media platform on smartphones (100; 62.9%). Others included Facebook (29; 18.2%) and Instagram (11; 8.8%) as depicted in Table I.

Self-report of smartphone addiction

The majority of the participants (116; 73%) reported being addicted to smartphones as shown in Table I.

Pattern of social media use and reported addiction across age and sex

Table II shows the distribution of frequently used social media platforms according to age and gender. There were significant differences across ages concerning the type of social media use; participants who used Facebook had the highest mean age (23.9±5.2 years) while those using Twitter had the lowest mean age (19.7±0.5 years) ($F = 2.64$; $p = 0.03$). There was no significant difference between the mean ages of participants who reported addiction and those who did not report addiction (21.7±4.5 years vs 21.4±4.0 years; $t = 0.46$, $p = 0.64$).

There were no significant differences among gender in the type of social media frequently used ($\chi^2 = 6.71$, $p = 0.35$) or in self-reported smartphone addiction rates ($\chi^2 = 0.04$, $p = 0.34$).

Table I: Demographic profile, social media platform use and awareness of smartphone addiction

Variables	*Frequency*	*Percentage*
Age (Years)		
17-20	83	52.2
21-39	76	47.8
Level of Study		
100-200 Level	104	65.4
300-400 Level	55	34.6
Gender		
Male	57	35.8
Females	102	64.2
Social media platform frequently used on smartphones		
WhatsApp	100	62.9
Facebook	29	18.2
Instagram	14	8.8
Twitter	5	3.2
YouTube	4	2.5
Snapchat and others	7	4.4
Awareness of smartphone addiction		
Feels addicted	116	73.0
Feels not addicted	43	27.0

Social Media Addiction using SAS-SV

The scores ranged from 10 to 56 and the mean total score was 29.5 ±8.9. There was a significant difference between the mean score for males and females on SAS-SV (31.7±9.4 vs 28.0±8.5; t =2.42, p = 0.01). On the other hand, there was no significant difference in the mean scores on SAS-SV between the younger age group and the older age group (29.2±10.0 vs 29.4±8.6; t = 0.12, p = 0.99.)

The items mean scores on the SAS-SV and the mean scores were as follows:

a. Missing work due to smartphone use: 3.2±1.7.
b. Having a hard time concentrating in class, while doing assignments, or while working due to smartphone use: 2.4±2.0.
c. Feeling pain in the wrists or at the back of the neck while using a smartphone: 2.7±1.5.
d. Will not be able to stand not having a smartphone: 3.2±1.8.
e. Feeling impatient and fretful when I am not holding my smartphone: 2.6±1.7.
f. Having my smartphone in my mind even when I am not using it: 3.0±1.6.
g. I will never give up using my smartphone even when my daily life is already greatly affected by it: 2.4±1.6.
h. Constantly checking my smartphone so as not to miss conversations between other people on Twitter or Facebook: 2.8±1.6.
i. Using my smartphone longer than I had intended: 4.0±1.6.

j. The people around me tell me that I use my smartphone too much: 2.7±2.7.

Table II: Age and gender characteristics in relation to social media platforms accessed via smartphones

Social media platforms	*Age Group Class*		*Age (Mean±SD)*	*Gender*	
				Males n (%)	Females n (%)
	≤20 years	≥21 years			
WhatsApp	49(49.0%)	51(51.0%)	23.9±5.2	33 (33.0%)	67 (67.0%)
Facebook	12(41.0%)	17(59.0%)	21.2±3.6	14 (48.0%)	15 (52.0%)
Instagram	10(71.4%)	4(28.6%)	20.0±3.3	3 (21.4%)	11 (78.6%)
Twitter	4(80.0%)	1(20. 0%)	19.7± 0.5	1 (25.0%)	4 (75.0%)
YouTube	3(75.0%)	1(25.0%)	20.0±1.7	3 (60.0%)	1 (40.0%)
Others	5(100)	2(0.0)	21.0± 2.0	3 (43.0%)	4 (57.0%)
			F = 2.64,P = 0.03*		

F - ANOVA Test; SD – Standard deviation

Overall, 34.6% of the total participants (55/159) met the criteria for smartphone addiction among both males and females.

About a quarter of the females (27; 25.5%) met the criteria for Smartphone addiction on the SAS-SV but there was no significant difference in smartphone addiction between the younger age group and older age group among females (χ^2 = 0.11, p = 0.74) as shown in Table IV. There were no significant differences in the mean age of females who were addicted to smartphones and those who were not addicted to the smartphone (20.4±2.5 vs 20.2±2.4 years; t = 0.39, p = 0.71).

About half of the males, 50.8% met the criteria for smartphone addiction. There were no significant differences in the mean age of males who were addicted and those who were not addicted to smartphones (22.6±4.9 vs 24.3±5.4 years; t = 1.08, p = 0.29).

Psychological Morbidity Using SRQ-20

Participants who met the criteria for psychological morbidity made up 48.4% of the total number of participants in the study. The scale items with the highest mean were as follows:

Item 1 - Having Headaches (0.5±0.5)

Item 5 - Feeling frightened (0.4± 0.5)

Item 6 - Feeling Nervous (0.4±0.5)

Those who met the criteria for psychological morbidity made up 43.9 % of the total number of males compared to 51% among females. There was no significant difference in the relationship between gender and frequency of psychological morbidity: χ^2 = 1.42, p = 0.23. Also, there was no significant difference between the mean ages of students who met the criteria for psychological morbidity and those who did not meet the criteria (21.3±4.2 vs 21.7±3.9 years; t = 0.480, p = 0.63).

Social media type, Smartphone Addiction, and psychological morbidity

Table III shows the mean scores on SAS-SV and SRQ-20 across various users of social media. Students who used Instagram had the highest mean scores on 31.4±9.4 and 8.07±5.38 on SAS-SV and SRQ-20 respectively.

Psychological morbidity and Smartphone Addiction

As shown in Table IV, for male students, there was a significant association between smartphone addiction and psychological morbidity (χ^2 = 5.22, p = 0.01) and between self-reported smartphone addiction and smartphone addiction as measured on SAS-SV, (χ^2 = 4.491, p = 0.03). Also, there was no significant association between self-reported addictions and psychological morbidity among males, (χ^2 = 3.19, p = 0.07).

Table III: Age and Gender in relation to mean SRQ-20 scores and prevalence of psychological morbidity

	Gender			*Age (Years)*		
	Males (n=57)	Females (n=102)	Statistics	≤20	≥21	Statistics
SRQ=20 SCORES						
Mean SRQ Scores	4.9±4.1	5.9±3.8	t = 1.44, p = 0.15	5.2±4.2	5.2±4.2	t = 0.05, p = 0.95
Psychological morbidity	n (%)	n (%)		n (%)	n (%)	
Yes	25 (43.9)	53 (52.0)	X^2=0.35 P=0.36	38(50.0)	39(47.0)	X^2=2.45 P=0.11
No	32 (32.1)	49 (48.0)		38(50.0)	63(53.0)	

For females, there were no significant association between smartphone addiction and psychological morbidity (χ^2 = 0.069, p = 0.8). There was also no significant association between self-reported addictions and psychological morbidity (χ^2 = 0.229, p = 0.93). However, there was a significant difference across age groups with the older age group having a higher percentage of those meeting the criteria for smartphone addiction (χ^2 = 6.21, p = 0.01).

Discussion

The present study explored gender and age differences in relation to smartphone addiction, social media use, and associated psychological morbidity. The demographics of the sampled population were slightly skewed with females making up the higher percentages with a slightly higher concentration within the 21-40 years group. Self-reported smartphone addiction was slightly higher among females. This is in keeping with the view that females have a higher frequency of self-reporting about their use of smartphones and smartphone addiction. [22] Males are usually not forthcoming with information about their use of smartphones like females. [22] It is interesting to note that participants in the study viewed addiction as an attachment to their smartphones just like attachment to jewellery or other precious items.

WhatsApp was the most frequently accessed social media platform followed by Facebook. The finding in the present study differed from previous reports among college students in another southwest Nigerian university which reported Facebook and Twitter as the most frequently accessed platforms. WhatsApp is accessed via smartphones, and with social chatting features, instant messaging, telephone services and group chats make it very attractive for socially conscious and active individuals. WhatsApp is also the most frequently accessed social media platform in Nigeria according to a recent survey. [23] The findings mirror the report from a nationwide survey of social media use which showed WhatsApp as the most frequently accessed social media platform. [23] Further, studies have reported that WhatsApp accounts for about 20% of all smartphone activities and females have been reported to use this platform for a longer period and more frequently. [24]

Facebook was a distant second with other new social media platforms such as Instagram, Twitter, and Snapchat in decreasing frequencies. Previous studies in Nigeria showed that Facebook was the dominant social media phone application and its usage among undergraduates centred on chatting and social communication. [25]

Table IV: Age, gender, psychological morbidity in relation to smartphone addiction

	Smartphone addiction		*Statistics*	*SAS-SV Scores*	*Statistics*
	Yes n (%)	No n (%)		*Mean± Standard deviation*	
Males	29 (50.8)	28 (49.2)		31.7±9.4	t = 2.42
Females	26 (25.5)	76 (74.5)		28.0±8.5	p = 0.01
Total	55(34.6)	104 (65.4)			
Age					
≤20 years	25 (30.0)	58 (70.0)	$\chi^2 = 0.50$ p = 0.47	29.2±10.0	t = 0.12 p = 0.91
≥21 years	30 (39.5)	46 (60.5)		29.4±8.6	
Age (Females)					
≤20	15 (23.4)	49 (76.6)	$\chi^2 = 0.11$ p = 0.74		
≥21	11 (29.0)	27 (71.0)			
Age (Males)					
≤20	10 (53.0)	9 (47.0)	$\chi^2 = 0.32$ p = 0.57		
≥21	19 (50.0)	19 (50.0)			
Psychological morbidity(Males)					
Yes	17 (68.0)	8 (32.0)	$\chi^2 = 5.22$ p = 0.02		
No	12 (37.0)	20 (63.0)			
Psychological Morbidity (Females)					
Yes	12 (23.0)	40 (77.0)	$\chi^2 = 2.19$ p = 0.14		
No	14 (28.0)	36 (72.0)			

However, with the advent of WhatsApp and more recent social-friendly phone applications, Facebook may have lost its dominance. Expectedly, with time, the dynamics may change as more social media phone applications are created and more users switch from one feature to another. The appeal is expected to be higher among the younger age groups. This may be a reason behind the finding in the present study which differed from a similar study conducted among college students within southwest Nigeria, four years ago. [25]

Across age groups, a larger proportion of those who used the much older social media phone applications was within the older age group (≥21 years). While those who were younger used more modern social media phone applications such as Instagram, YouTube, Snapchat, and others. This may reflect a changing pattern with a generational shift, as new social media platforms emerge. The findings in the present study also showed that Facebook users had the highest mean age while those who used Twitter had the lowest mean age. It was also observed that the mean ages declined along more recent social media phone applications. A similar pattern across age groups has been reported in surveys in the US, especially among young adults.

The majority of users of social media platforms in the present study were females except for YouTube. The results were reflective of the differences in social media usage across gender. Many surveys have

shown that females use more social media platforms than males. [26] This finding is also consistent with the literature on the pattern of gender usage of social media. Males have been observed to explore social media platforms more to watch videos, games, pornography and functional purposes. [27] Therefore, platforms such as YouTube, a video sharing phone application was more popular among males just as the present study showed. On the other hand, females tend to use social media for communication, chatting and posting pictures. [28]

Those who met the criteria for smartphone addiction constituted about a third of the sampled population in the present study. The results were much lower than what was reported among college students in another university in Nigeria using similar instruments. [17] Major differences lie in the sampling technique and the cut-off scores used to determine smartphone addiction. The prevalence of smartphone addiction was lower than what was reported in Saudi Arabia [14] but higher than the rate reported in Switzerland (16.9%), [10] Jordan, [29] and China. [30] The mean score from the findings in the present study was very similar to the findings using SAS-SV among a larger population in China. [31] On scale items, the results showed that spending a longer time than intended had the highest mean score due to the habitual use of smartphones and it was also indicative of the excessive and inappropriate amount of time that is spent using a smartphone, with neglect of work as a consequence. This may be the reason why in this study, missing work due to smartphone use had the second highest mean score.

Consistent with several works of literature, gender differences were observed among the participants in the present study concerning smartphone addiction, with the males having a higher proportion of smartphone addicts. [14,18, 30, 32] Interestingly, though the present study findings showed that females used more social applications and considered themselves more addicted than males, males had a higher proportion of those who met the criteria for smartphone addiction. Studies have related the difference to the pattern of use of social media and motives behind the use. As earlier mentioned, males tend to use smartphones for games, videos, viewing pornography and listening to music while females use it for social communication and socialization. [33]

It was observed that male smartphone addiction was significantly associated with psychological morbidity while female smartphone addiction was not associated with psychological morbidity. The findings showed that females had a higher proportion of those with psychological morbidity but it was not significantly associated with smartphone addiction. As noted, studies have shown that male addicts have negative consequences. [14] Studies have documented anxieties, insomnia, depression, poor concentration as some of the consequences. [30] The nature of the relationships with psychological morbidity, especially among males, is unclear. However, it has been suggested that smartphone addiction is a coping strategy for stress, depression, and avoidance. [30,34] Some have also attributed the gender differences in smartphone addiction to differing hormonal regulation in both males and females. [35] There were no significant differences across age groups concerning smartphone addiction and psychological morbidity. These findings were similar to the report in studies conducted among college students in Nigeria and Saudi Arabia, concerning age and smartphone addiction. [2, 17] This observation may be attributed to similarities in the attitudes regarding smartphone cutting across college students in Nigeria as reported in previous research. [17]

Smartphone addiction is a growing problem and it is associated with psychological morbidity. This should be of concern to therapists, especially with males, who though

may not be frequent users, compared to females. Addiction to smartphones may underlie sinister psychological morbidity. Educators and therapists should aware of the need for proper orientation towards the use of smartphone devices among college students.

The findings in the present study may not accurately predict the pattern due to the limited sample size and a sample size that was not representative of all the faculties and student population. Also, the statistical validation of the Smartphone Addiction Scale was not done. Future studies will be needed to validate the SAS-SV in a much larger population.

The present study did not explore other potentially related variables such as hours of use, income, monies spent, levels of study with smartphone addiction. The cross-sectional nature of the present study with the participants drawn from a University cannot provide a basis for generalization and causality. The use of smartphones concerning academic performances was also not explored.

Conclusion

Smartphone addiction is prevalent and associated with psychological morbidity among male undergraduates. It is highly recommended that smartphone education and cognitive behavioural therapy should be instituted among smartphone addicts, especially males. More rational use should also be encouraged by teachers and counsellors to enshrine good phone habits among college students.

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References

1. Sager I. Before iPhone and Android came Simon, the first smartphone. Bloomberg Businessweek 2012; 29. Retrieved from https://www.bloomberg.com/news/articles/2012-06-29/before-iphone-and-android-came-simon-the-first-smartphone. Accessed on March 1st, 2020.

2. Alosaimi FD, Alyahya H, Alshahwan H, Al Mahyijari N, Shaik SA. Smartphone addiction among university students in Riyadh, Saudi Arabia. Saudi Med J 2016; 37(6): 675-683.

3. Alhazmi AA, Alzahrani SH, Baig M, Salawati EM. Prevalence and factors associated with smartphone addiction among medical students at King Abdulaziz University, Jeddah. Pakistan J Med Med Sci 2018; 34(4): 984-988.

4. Smith A, Page D. US smartphone use in 2015. Pew Research Center. 2015.

5. Lee TY, Busiol D. A review of research on phone addiction amongst children and adolescents in Hong Kong. Int J Child Adolesc Health 2016; 9(4): 433.

6. Samaha M, Hawi NS. Relationships among smartphone addiction, stress, academic performance, and satisfaction with life. Computers Human Behav 2016; 57: 321.

7. Statista [internet] Number of smartphone users worldwide from 2014 to 2020. [[Accessed on 29thAugust 2019]]. Available from: https://www.statista.com/statistics/330695/number-of-smartphone-users-worldwide/

8. Lepp A, Li J, Barkley JE, Salehi-Esfahani S. Exploring the relationships between college students' cell phone use, personality and leisure. Computers Human Behav 2015; 43: 210-219.

9. Anderson M, Jiang J. Teens, social media and technology 2018. Pew Research Center 2018; 31:2018.

10. Haug S, Castro RP, Kwon M, Filler A, Kowatsch T, Schaub MP. Smartphone use and smartphone addiction among young people in Switzerland. J Behav Addict 2015; 4(4): 299-307.

11. Young KS. Internet addiction: A new clinical phenomenon and its consequences. Am Behav Sci 2004; 48(4): 402-415.

12. American Psychiatric Association. Diagnostic and statistical manual of mental disorders (DSM-5®). American Psychiatric Pub; 2013.

13. Bianchi A, Phillips JG. Psychological predictors of problem mobile phone use. Cyber Psychol Behav 2005; 8(1): 39-51.

14. Aljomaa SS, Qudah MF, Albursan IS, Bakhiet SF, Abduljabbar AS. Smartphone addiction among university students in the light of some variables. Computers Human Behav 2016; 61: 155-164.

15. Lin YH, Chiang CL, Lin PH, Chang LR, Ko CH, Lee YH, *et al*. Proposed diagnostic criteria for smartphone addiction. PLoS ONE. 2016; 11(11): e0163010.

16. Olukayode K. Nigeria mobile Report 2019. Retrieved from https://www.jumia.com.ng/mobile-report/

17. Oharisiagbon OE, Onowhakpor AO. Knowledge, attitude, prevalence and determinants of Smartphone Addiction among undergraduate students of the University of Benin, Benin-City, Edo State Nigeria. Niger Hosp Pract 2019; 23(1-3): 8-15.

18. Kwon M, Kim, DJ, Cho H, Yang S. The smartphone addiction scale: development and validation of a short version for adolescents. PLoS ONE 2013; 8(12): e83558.

19. Scholte WF, Verduin F, van Lammeren A, Rutayisire T, Kamperman AM. Psychometric properties and longitudinal validation of the self-reporting questionnaire (SRQ-20) in a Rwandan community setting: a validation study. BMC Med Res Methodol 2011; 11(1): 116.

20. Sartorius N, Janca A. Psychiatric assessment instruments developed by the World Health Organization. Soc Psych Psych Epidemiol 1996; *31*(2): 55-69.

21. Abiodun OA. Sensitivity and validity of the Self-Reporting Questionnaire (SRQ) in a primary health care centre in a rural community in Nigeria. Psychopathologie Africaine 1988; 22(1): 79-88.

22. Kim NS, Lee KE. Effects of self-control and life stress on smartphone addiction of university students. J Korea Soc Health Informatics Stat 2012; *37*(2): 72-83.

23. Udodiong I. Pulse Nigeria-How Nigerians are using the internet in 2019 - Pulse Nigeria. Retrieved from https://www.pulse.ng › tech › how-Nigerians-are-using-the-internet-in-2019. Last accessed on 7th October 2019.

24. Montag C, Błaszkiewicz K, Sariyska R, Lachmann B, Andone I, Trendafilov B, *et al*. Smartphone usage in the 21st century: who is active on WhatsApp? BMC Res Notes 2015; 8(1): 331.

25. Adepoju TO, Ladipo SO, Kolawole AA. Do social media utilization and addiction influence undergraduate students' self-perception? A case study of the University of Ibadan, Nigeria. J Emerging Trends Educ Res Policy Studies 2015; 6(7): 271-277.

26. Perrin A. Social media usage. Pew Research Center 2015: 52-68. Retrieved from https://www.pewresearch.org/internet/2015/10/08/social-networking-usage-2005-2015/. Accessed March 1st, 2020.

27. Rehbein F, Mößle T. Video game and Internet addiction: is there a need for differentiation? Sucht 2013; 59(3): 129–142.

28. Lee KE, Kim SH, Ha TY, Yoo YM, Han JJ, Jung JH, *et al*. Dependency on smartphone use and its association with anxiety in Korea. Public Health Reports 2016; 131(3): 411-419.

29. Abo-Jedi A. Cellphone addiction and its relation to self-closure in a sample of Jordanian university and Amman private university students. Jordanian J EducSci 2008; 4: 137-150.

30. Chen B, Liu F, Ding S, Ying X, Wang L, Wen Y. Gender differences in factors associated with smartphone addiction: a cross-sectional study among medical college students. BMC Psych 2017; 17(1): 341.

31. Luk TT, Wang MP, Shen C, Wan A, Chau PH, Oliffe J, *et al*. Short version of the Smartphone Addiction Scale in Chinese adults: Psychometric properties, sociodemographic, and health behavioral correlates. J Behav Addict 2018; 7(4): 1157-1165.

32. Choi SW, Kim DJ, Choi JS, Ahn H, Choi EJ, Song WY, et al. Comparison of risk and protective factors associated with smartphone addiction and Internet addiction. J Behav Addict 2015; 4(4): 308-314.

33. De-Sola Gutiérrez J, Rodríguez de Fonseca F, Rubio G. Cell-phone addiction: a review. Frontiers Psych 2016; 7: 175.

34. Machell KA, Goodman FR, Kashdan TB. Experiential avoidance and well-being: A daily diary analysis. Cognition Emotion 2015; 29(2): 351-359.

35. Naninck EF, Lucassen PJ, Bakker J. Sex differences in adolescent depression: do sex hormones determine vulnerability? J Neuroendocrinol. 2011; 23(5): 383–392.

Appendix A: Smartphone Addiction Scale -Short version (SAS-SV)

Item	Strongly Disagree	Disagree	Weekly disagree	Weekly agree	Agree	Strongly Agree
1.Missing planned work due to smartphone use						
2. Having a hard time concentrating in class, during assignments, or at work						
3. Feeling pain in the wrists or at the back of the neck while using a smartphone						
4. Won't be able to stand not having a smartphone						
5. Feeling impatient and fretful when I am not holding my smartphone						
6.Having my smartphone in my mind even when I am not using it						
7. I will never give up using my smartphone even when my daily life is already greatly affected by it.						
8. Constantly checking my smartphone so as not to miss conversations between other people on Twitter or Facebook						
10.Using my smartphone longer than I had intended						
11. The people around me tell me that I use my smartphone too much.						
12.Using my smartphone longer than I had intended						

Appendix B: Mental Health Problems - Self-Reported Questionnaire (SRQ)

Part of the NTD related morbidity and disability assessment and monitoring toolkit

If you think the question applies to you and you had the problem described in the *last 30 days* to answer "Yes".

Item	Question	YES	NO
1.	Do you often have headaches?	Yes (1)	No (0)
2.	Is your appetite poor?	Yes (1)	No (0)
3.	Do you sleep badly?	Yes (1)	No (0)
4.	Do your hands shake?	Yes (1)	No (0)
5.	Are you easily frightened?	Yes (1)	No (0)
6.	Do you feel nervous, tense or worried?	Yes (1)	No (0)
7.	Is your digestion poor?	Yes (1)	No (0)
8.	Do you have trouble thinking clearly?	Yes (1)	No (0)
9.	Do you feel unhappy?	Yes (1)	No (0)
10.	Do you cry more than usual?	Yes (1)	No (0)
11.	Do you find it difficult to enjoy your daily activities?	Yes (1)	No (0)
12.	Do you find it difficult to make decisions?	Yes (1)	No (0)
13.	Is your daily work suffering?	Yes (1)	No (0)
14.	Are you unable to play a useful part in life?	Yes (1)	No (0)
15.	Have you lost interest in things?	Yes (1)	No (0)
16.	Do you feel that you are a worthless person?	Yes (1)	No (0)
17.	Has the thought of ending your life been on your mind?	Yes (1)	No (0)
18.	Do you feel tired all the time?	Yes (1)	No (0)
19.	Do you have uncomfortable feelings in your stomach?	Yes (1)	No (0)
20.	Are you easily tired?	Yes (1)	No (0)
Total:			

Time at the end of the interview:_____:_____