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Research Article
Health Problems Associated with Frequent Use of Cell Phone Among Students in University of Ibadan, Nigeria

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Abstract

Background and Objectives: Mobile phones are no longer considered an accessory but have become a basic requirement of people's lives. So, many people especially the youth are dedicating a major part of their daily routine to using mobile phones. The popularity of the cell phones is often followed by an alarm towards the detrimental effects of cell phone radiations. This study aimed to identify the health problems related with frequent use of cell phone among undergraduate students of University of Ibadan, in southwestern Nigeria. **Materials and Methods:** The study was carried out among selected undergraduate students of the University of Ibadan, Nigeria. Purposive sampling technique was used to select 364 students from five halls of residence. A self administered semi-structured questionnaire was used to elicit information on the socio-demographics, extent of cell phone usage, factors that influence the pattern of cell phone usage, perceived health concerns with frequent usage of cell phone. Data collected were subjected to percentage; mean, standard deviation, correlation and chi-square statistical analyses. **Results:** Few (22.7%) of the students reported strong attachment to their phone and cannot do without it in a day and believed that the attachment could cause insomnia, migraine and even cancer. The findings revealed that few (37.7%) of respondents agreed that frequent phone usage could cause cancer, loss of concentration (51.7%) and anxiety (55.4%) **Conclusion:** The study concluded that there was a direct relationship with strong attachment to phone usage and insomnia, headaches and concentration which can affect the health and academic performance of students.

Key words: Mobile phone, adolescent, correlate of health problems, addictive behavior, phone radiations, insomnia

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Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

Twenty first century can be interpreted as telecommunication age, when new communication technologies spread among the people, one of which is the cell communication. Cell/cell phones are considered to be one of the most speedily emerging technologies in the human existence[1,2]. A cell phone is a long-range, electronic device used for cell voice or data communication over a network of specialized base stations known as cell sites. Mobile phones utilize frequencies transmitted by cellular towers to connect the calls between two devices. In addition to the standard voice function of a cell phone, it supports many additional services and accessories, such as short message service (SMS), email, packet switching for access to the internet, gaming, bluetooth, infrared, camera with video recorder and multimedia message service (MMS) for sending and receiving photos and video, MP3 player, radio, television and geographic positioning system[3,4]. Most current cell phones connect to a cellular network of base stations (cell sites), which are in turn interconnected to the public switched telephone network[1,5].

There was a drastic increase in subscription of cell phones in developing countries which might have outnumbered the subscription in developed countries[1,6]. Also, there has been quite an enormous amount of popularity of cellular phones in younger generation within a short span of time[7]. According to Nigerian Communications Commission, the Nigeria's internet users have risen to 91.6 millions[8]. Youth is more inclined towards using cell phones for activities other than communication than older generation, because in adolescence stage, people are more susceptible to changing fashion trends and style, making them more tech savvy which can lead to some behavioral disorders[9-11].

The dependence on the cell phone is increasingly high because it has become a basic requirement of people lives especially youth who are dedicating a major part of their daily routine to its use. Cell phone obsession is now a foremost major non-drug addiction of the developing century[12]. According to Tindell and Bohlander[13], cell phones have integrated themselves to be part of college life and culture. Even a casual observation of today's college students will reveal cell phones being used, both overtly and covertly, in every possible campus setting including the classroom. This is so, because it provides a great ease to access the internet thereby aiding a well informed learning process. However, cell phones have been reported to cause discomfort, general ill-being, nausea, muscular pain, forgetfulness and fatigue. It has been shown that young people who use cell phones excessively (for both speaking and text messaging) caused restlessness, more careless lifestyles, greater consumption of stimulating beverages and greater susceptibility to stress. Risky behaviour with a cellular phone includes its use while driving[14].

The popularity of the cell phones is often followed by an alarm towards the detrimental effects of cell phone radiations[15]. Because cell phone uses a wireless technology, that transmit packet on different wavelength, health risks from the most hazardous radiations have been associated to cell phones[16]. Fatigue, headache, decreased concentration in studies, local irritation and burning, reduction in male fertility potential and carcinogenic have been recorded as the major effect of excessive usage of cell phones[17-19]. Also, high quantitative cell phone exposure are associated with mental overload, disturbed sleep, the feeling of never being free, role conflicts, feelings of guilt due to inability to return all calls and messages, somatic complaints, anxiety and insomnia, depression, psychological distress and an unhealthy lifestyle[20-22]. So, this study was aimed to investigate the pattern of mobile phone usage and examine its frequent use as a correlate of health problems among students of University of Ibadan, in southwestern Nigeria.

MATERIALS AND METHODS

Study area: The University of Ibadan, UI as it is often referred to, was established in 1948 and is the first University in Nigeria. It is located five miles (8 km) from the center of the city. The university is primarily residential for both male and female students.

Study design: A cross-sectional study design was used to assess the frequent use of cell phon/e as a correlate of health problems among the undergraduate students of University of Ibadan, Nigeria. The study population consists of the selected undergraduate students of the university.

Samples and sampling techniques: The study used multistage sampling techniques, which involved the following steps: Simple random sampling to select five undergraduate halls out of 9 halls of residence. Two of the male halls (Azikwe and Melanby) were randomly selected out of four while three female halls (Kuti, Idia and Queens) were selected from the five undergraduate halls of residence. Proportionate sampling

technique was used to select 10% (0.1) of the total population of each of the selected halls. The total number of students in each of these halls was gotten from the Student Affairs Division Office, University of Ibadan. The population in the halls of residence is as follows:

- Azikwe-999 students = $0.1 \times 999 = 99.9 \approx 100$ students
- Melanby-414 students = $0.1 \times 414 = 41.4 \approx 41$ students
- Kuti-520 students = $0.1 \times 520 = 52$ students
- Queens-550 students = $0.1 \times 550 = 55$ students
- Idia-1,158 students = $0.1 \times 1158 = 115.8 \approx 116$ students

Thereafter, purposive sampling technique was used to choose respondents from each hall. A total of th 364 students were selected and used for the study.

Instrument used: A self semi-structured questionnaire was used to elicit information on the socio-demographics, extent of cell phone usage, factors that influence the pattern of cell phone usage, perceived health concerns with frequent usage of cell phone. The questionnaire is made up of questions on the variables tested and was in 4 point Likert scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). The research instrument was validated using content validity method and was validated by experts in the field. The reliability of the instruments was done using the test-retest reliability. The pre-test was conducted on 36 students of neighbour sister university who are not part of the main population for the study. The pre-test questionnaire was analyzed using Cronbach's Alpha which gave a value of 0.84.

Data analysis: The statistical methods used in this study were descriptive statistics of frequency, percentage, mean and standard deviation. Inferential statistics of Pearson Product Moment Correlation was used to estimate the relationship between the undergraduate students' level of cell phone usage and other dependent variables at 0.05 alpha level of significance.

RESULTS

Section A

Demographic characteristics of the undergraduate students of University of Ibadan UI: The result showed that most of the respondents were adolescents (93.1%) and comprise of more male than females (Table 1). Majority of the respondents (37.0%) have used their current cell phone at the time of this study between 1-5 years.

Section B

Extent of cell phone use among undergraduate students of UI: The findings showed that majority (57.7%) of the respondent strongly agreed that all students in the university has a cell phone and with 56.1% suggesting that most students have more than one phone (Table 2). The results showed that over 54.7% of the respondents use their phone for surfing the internet at any location within the university campus. The

Table 1: Demography of the respondents

Variables	Frequency (%)
Age (years)	
18-22	144 (45.28)
23-27	152 (47.80)
>27	22 (6.2)
Sex	
Male	193 (51.4)
Female	161(48.6)
Level of study	
100	133 (36.5)
200	36 (9.9)
300	79 (21.7)
400	107 (29.4)
500	9 (2.5)
Religion	
Christianity	284 (78.5)
Islam	74 (20.4)
Traditional	4 (1.1)
Year of cell phone usage	
<1 year	18 (5.0)
1-5 years	134 (37.0)
6-10 years	110 (30.4)
>10 years	100 (27.6)

Table 2: Extent of cell phone use among undergraduate students of UI

Statements	SA (%)	A (%)	D (%)	SD (%)
All the students in university has a cell phone	209 (57.7)	131(36.2)	16 (4.4)	4 (1.1)
Most UI students are using their phone to browse the internet	171(47.2)	175 (48.3)	13 (3.6)	2 (0.6)
Most UI students have more than one phone	73 (20.2)	203 (56.1)	80 (22.1)	3 (0.8)
Smartphone are very common among UI students	190 (52.5)	151 (41.7)	14 (3.9)	2 (0.6)
UI students use their phone anywhere within the campus	198 (54.7)	129 (35.6)	23 (6.4)	8 (2.2)
UI students spend more time with their phone during the weekends	153 (42.7)	161 (45.0)	44(12.3)	0 (0)

SA: Strongly agree, A: Agree, D: Disagree, SD: Strongly disagree

findings revealed that 45.0% of students agreed that UI undergraduate students spend more time with their phone during the weekends.

Section C

Personal factors that influence pattern of cell phone usage among undergraduate students in UI: Data in Table 3 showed that few (22.7%) of the respondents reported strong attachment to their phone and cannot do without their phone in a day and 18.2% strongly agreed that they were not complete without their phone. Furthermore, findings showed that only few (5.2%) strongly agreed on the placement of more value on their phone than clothes and food, while a greater number of the respondents (41.2%) felt unsettled when they forget to go out with their phone.

Section D

Knowledge of the frequent use of cell phones and perceived health hazards among undergraduate students of UI: Majority (43.0%) of respondents agreed that cell phone usage could cause brain tumor and 40.2% agreed that high level of phone usage can lead to insomnia. The findings revealed that few (37.7%) of respondents agreed that frequent phone usage could cause cancer, loss of concentration (51.7%) and anxiety (55.4%) (Table 4).

From Table 5, it was revealed that there is a significant positive relationship between sleep disturbance and level of phone use ($r^2 = 0.118$, $p<0.05$). Hence, UI students agreed that high level of phone usage can cause and predispose people to positive relationship between severe headache and level of phon use ($r^2 = 0.121$, $p<0.05$). It was observed that a

Table 3: Personal factors that influence pattern of cell phone usage among undergraduate students of UI

Statements	SA (%)	A (%)	D (%)	SD (%)
I change my phone in every 3 months	8 (2.2)	12 (3.3)	169 (46.7)	171 (47.5)
Everyone in my class has at least a cell phone	199 (55.1)	138(38.2)	21 (5.8)	3 (0.8)
I communicate every day on social media.	8 (2.2)	17 (4.7)	133(36.7)	202 (56.1)
I don't attach any importance to my phone	19 (5.2)	61(16.9)	184 (50.8)	91 (25.6)
I can't do without my phone in a day	82 (22.7)	118(32.6)	121(33.6)	31 (10.8)
Am not complete without my phone	66 (18.2)	96 (26.5)	113 (21.2)	84 (23.4)
I give my cell phone more priority than clothes and food.	19 (5.2)	46 (12.7)	171 (47.5)	124 (34.4)
I feel unsettled when I forget to take my cell phone with me	71 (19.6)	149 (41.2)	102 (28.2)	29 (10.8)
I would rather lose my wallet or purse than my cell phone	40 (11.0)	100 (27.6)	124 (34.3)	95 (26.5)
I don't really want to go to places where cell phone signals are weak	77 (21.4)	176 (48.9)	81 (22.5)	26 (7.2)
When I am in a vehicle, I tend to handle my cell phone	60 (16.8)	199 (55.0)	81 (22.4)	18 (5.0)
I use my phone when I am in the company of one or two other people	33 (9.1)	193 (53.3)	105 (29.0)	28 (7.7)
I check my phone for SMS even when it hasn't ring	51 (14.1)	123 (34.1)	129 (35.7)	58 (16.1)
I find it hard to keep company with people who don't have smart phones	15 (4.1)	32 (8.8)	139 (38.4)	171 (47.9)
I have a special ringtone on my phone	102 (28.3)	116 (32.2)	101 (28.1)	41 (11.4)

SA: Strongly agree, A: Agree, D: Disagree, SD: Strongly disagree

Table 4: Knowledge of the pattern of use of cell phones and perceived health hazards among undergraduate students of UI

Statements	SA (%)	A (%)	D (%)	SD (%)
Cell phone use cause brain tumor	46 (13.1)	151 (43.0)	112 (31.9)	42 (12)
Cell phone use do cause insomnia	43 (12.4)	140 (40.2)	132 (37.9)	33 (9.5)
Cell phone use do cause migraine	43 (12.3)	140 (40.1)	139 (39.8)	27 (7.7)
Cell phone use do cause cancer	53 (15.0)	133 (37.7)	133 (37.7)	34 (9.6)
Cell phone use do cause lost of concentration	133 (38.0)	181 (51.7)	28 (8.0)	8 (2.3)
Cell phone use do cause anxiousness	89 (25.3)	195 (55.4)	57 (16.2)	11 (3.1)

SA: Strongly agree, A: Agree, D: Disagree, SD: Strongly disagree

Table 5: Pearson product moment correlation between the level of phone usage and testing variables

Variables	N	Mean	SD	DF	R^2	Sig	p-value
Anxiousness	351	1.97	0.74				
Level of phone use	351	29.73	5.75	349	0.039	0.467	>.05
Sleep disturbance	351	2.45	0.83				
Level of phone use	351	29.73	5.75	349	0.118	0 .029	<.05
Exposure to radioactive substances	351	2.42	0.86				
Level of phone use	351	29.73	5.75	349	0 .019	0 .722	>.05
Severe headache	351	2.43	0.81				
Level of phone use	351	29.73	5.75	349	0.121	0 .026	<.05
Inability to concentrate	351	1.75	0.70				
Level of phone use	351	29.73	5.75	349	0.061	0.261	>.05

significant number of UI students belief that increase in the level of phone use of an individual can cause high experiences of severe headache than those with low phone use.

DISCUSSION

In this study, it was observed that all the students interviewed except two had their own mobile phone mobile and that phone use was very high among undergraduate students of both the sexes[23]. Less than 10% of the students reported spending time on social media daily which may be because of high cost of data subscription and poor internet service. They however; frequently used it for taking pictures, recording videos, playing games, listening to music as was also found in another study by Morgan[24]. Phone usage habit within the campus showed that 327 (90.3%) of the students use their phone at any location within the campus. This was in line with a report by Jambulingam and Sorooshian[25] that young adult spent more time on the cell telephones. Most of the students (71%) thought that mobile phone is a ready company while travelling and others (61%) admitted that they cannot imagine life without a mobile phone, especially when they forget it somewhere which indicated their dependent and addictive behavior. This suggested that adolescents are more prone adopt and become addictive to new technologies and some consequent behavioral characteristics as they are more susceptible to trending fashion styles[26-27]. This is in agreement with studies conducted on Australians adolescents and Indian medical[27-29] who reported that participants have very strong attachment to their cell phones. It was also revealed that there is no significant relationship between exposure to radioactive substances and level of phone use ($r^2 = 0.019$, $p>0.05$). Hence, exposure to radioactive substances cannot cause cancer. This was in contrast to previous studies that use of a cordless phone increased the risk of certain types of tumors on the same side of the head and brain tumor risk increased significantly with greater cell phone use[24,30]. It was discovered that there is a significant positive relationship between severe headache and level of phone use ($r^2 = 0.121$, $p<0.05$). These findings also correlated with the reported of Schuz *et al.*[31] that linked long-term cell phone use to migraines and dizziness. It was revealed that there is no significant relationship between inability to concentrate and level of phone use ($r^2 = 0.061$, $p>0.05$). This inferred that a significant number of UI undergraduate students agreed that high level of phone usage do not make an individual to lose concentration in his/her daily activities.

This suggested that a significant number of UI undergraduate students believed that increase in the level of phone use of an individual does not necessarily cause the individual to become anxious. This is in contrast with the study of Kamibeppu and Sugiura[32] that students tend to get engaged in text messaging and feel anxious when not receiving replies from their friends. Also, the study revealed a significant positive relationship between sleep disturbance and level of phone use ($r^2 = 0.118$, $p<0.05$). This was in line with the report of Arnetz *et al.*[33] that exposure to cell phone radiation before bed led to less sleep and poorer quality of sleep. Furthermore, it agreed with previous study by Roberts *et al.*[34], Van den Bulck[35], Fredriksen *et al.*[36] and Moore *et al.*[37] which that concluded that long term phone usage can cause disturbance in student's sleeping pattern, lack of sleep, staying up late at night, thus disrupting their daily routine which could be detrimental to one's psychological health and functioning. The heavy cell phone use also associated with somatic complaints, anxiety and insomnia, depression, psychological distress and an unhealthy lifestyle[20,22].

CONCLUSION

The study concluded that the use of mobile phone is very common among University of Ibadan undergraduate students. The study showed that there is a direct relationship with high phone usage and insomnia, headaches and regular sleep pattern which could affect the health and general well-being of students. However, there was no significant relationship between high level of phone usage and some disease like cancer and brain tumor. Students should reduce their attention on phone in order to stay healthy and the university authorities should integrate phone usage orientation as part of orientation programme for new intakes on the impacts on their educational performance, health and general wellbeing.

SIGNIFICANCE STATEMENT

This study discovered that the that there is a direct relationship with high phone usage and insomnia, headaches and regular sleep pattern which could affect the health and general well-being of students. This study will help the researchers to uncover the critical areas of Improvement on the orientation of the cell phone usage and the associated health effect that researchers can explore.

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