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ARE NIGERIAN UNDERGRADUATE MEDICAL STUDENTS ADDICTED TO THE INTERNET? PREVALENCE AND PREDICTORS

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ABSTRACT

Globally, internet addiction (IA)is now known as a disorder which arises from an overuse of available technology with a wide range of behaviours and impulse-control leading to poor psychological, mental and general well-being. This study aims to assess the prevalence and determinants of internet addiction among undergraduate medical students in Enugu State. This was a cross-sectional study conducted among 400 undergraduate medical students in two medical colleges in Enugu State, Nigeria. A pre-tested, semi-structured, questionnaire that adapted questions from Young's internet addiction test (YAT) was self-administered to the sampled students. Chi-squared tests of significance and binary logistic regression were used in the analysis. Results were reported as odds ratios at 95% confidence intervals. Findings reveal that the mean age of respondents was 21.9± 3.6 years and they were predominantly females (62.2%). Out of 400 respondents, 3 (0.8%) were found to have severe IA while 71 (17.7%) were found to be moderately addicted and 216(64%) had mild addiction. The remaining 110 (27.5%) students were found to have no addiction. Bivariate analysis revealed that mothers' highest educational qualification and students' educational sponsors were associated with IA. On multivariate analysis, sponsorship by siblings (AOR= 2.869, CI= 1.322-6.226) and relatives (AOR= 6.336, CI= 1.473-27.250) were predictors of IA. In conclusion, with increasing reliance on the use of internet especially among the young people, the risk of IA is inevitable. More comprehensive evaluations should be employed routinely among the students to prevent dependency on the internet given the current technological trends, proliferations of smart gadgets and globalization.

Keywords: Internet addiction, medical students, Prevalence, Predictors, Nigeria

INTRODUCTION

In 1995, Dr Ivan Goldberg categorized internet addiction (IA) as a pathological compulsive internet usage disorder that involves the overuse of this technology with a wide range of behaviours and impulse control. (Saliceti, 2015) In a study by Griffiths, he classified it as a subset of behavioural addiction that meets six core components of addiction; salience, mood modification, tolerance, withdrawal, conflict and relapse. (Griffiths, 1996) Although a study conducted by Walker rated that IA is not officially a recognized disease nor ailment, Young stated they may be a genetic predisposition to addictive behaviours. (Walker, 2012; Young K, 1999) Internet addicts prioritize the internet and possess insurmountable compulsion to use the social media, a mental preoccupation with being online, lying or hiding the extent of true online behaviour and an inability to control online behaviour. (Griffiths, 1996).

The global prevalence rate of IA among medical students is yet to be ascertained. Interestingly, studies have revealed that medical students from more developed countries with advanced technological know-how seem to have a lower prevalence of IA than developing countries. (Weinstein et al. 2010; Hassan et al. 2020)In fact, it is a known fact that the Asian continent is a global leader in IA with rates of up to 80% in some countries. (Haque et al 2016; Taha et al. 2019) Although there are different tools for classifying IA internet addiction, Young's assessment tool is the most widely used globally. (Young, 2010) This tool categorizes IA as mild, moderate and severe. The majority of the studies among the students revealed that the prevalence of severe forms of IA was lower than that for mild and moderate. While a recent study carried out in Morocco, revealed that the

prevalence of severe IA was as high as 23.3% among medical students, similar studies conducted in India, Nepal and Mauritius revealed rates as low as 0.3%, 3.1% and 5.1% respectively. (Mohamed et al. 2020; Sharma et al. 2014; Pramanik et al. 2012; Smita et al. 2018) A similar multinational study carried out in Croatia, India and Nigeria reported a combined rate of 0.5%. (Balhara et al. 2015).

Studies from different countries have reported that varying factors have been associated with IA including but not limited to social characteristics like age, sex, and educational qualification of parents, differing psychological issues including low self-esteem, poor academic performance with attendant poor attendance and high drop-out rates, influences through negative peer pressure and economic characteristics by the amount spent on recharging data as well as certain internet factors like speed of browsing and owning a private laptop or smart phone. (Mohamed et al. 2020; Sharma et al. 2014; Pramanik et al. 2012; Smita et al. 2018; Balhara et al. 2015) The valuable time wasted while excessively utilizing the internet could have been used for more productive activities including learning new skills or languages.

The study is aimed at measuring the prevalence and ascertaining the socio-demographic factors associated with IA among medical students at the university medical colleges in Enugu State. To the best of our knowledge, this study is the first of its kind in Enugu State and will invariably help the affected individuals, their parents, the physicians and the government to not only seek help but to implement relevant policies in a timely and strategic way.

MATERIALS AND METHODS

Study Area:

This study was carried out in Enugu State in the South-eastern region of Nigeria. Economically, the state is predominantly rural and agrarian with trading and civil service, most people are Christians. Two Colleges of medicine are situated within Enugu; the University of Nigeria, College of Medicine and the Enugu State University College of Medicine.

Study Design, Population and Sampling: This was a cross-sectional descriptive study of medical students in both colleges of medicine who own and use smart phones or other internet-enabled devices. The minimum sample size of 400 was determined using the prevalence of addiction among undergraduate students from a previous study carried out in Nigeria using the Fischers statistical formula. (Okwaraji et al. 2015) The sample frame of 1300 for both colleges was obtained from the administrative departments of both colleges. A two stage sampling technique was used to select the students. First, the students were stratified according to their current classes of one through six. The sample size for each class was proportionally allocated based on the number of students in the class. Using the systematic sampling technique, the sample interval was determined and students were recruited consecutively by simple random sampling.

Data Collection and Management:

Data was collected from four trained research assistants between April to June 2019. A pretested self-administered questionnaire adapted from the Young IAT was used. (Young, 1999) The numbers for each response on a Likert scale, ranging from 0 – 5 was summed up to obtain a final score. Using the IAT scoring system; Normal Range 0 – 30, Mild 31- 49, Moderate 50 -79, Severe 80 – 100; the higher the score, the greater the level of addiction.

Data Analysis

Statistical Package for Social Sciences version 22.0 (Armonk, NY: IBM Corp) was used for data entry and analysis. Frequencies and proportions were derived for categorical variables. Test of significance for discrete variables was done using the Chi-square test. Statistical significance was set at the value $P< 0.05$. Variable having a P-value <0.2 in the bivariate analysis were logged into the multivariate binary logistic regression model to determine predictors of internet addiction across different categorical variables. Results were reported as odds ratios at 95% confidence intervals.

Ethical Approval: Ethical clearance was

obtained from the Health Research and Ethics Committee of Enugu State University Teaching Hospital, Enugu with reference number: RA/034/V01.1/218. Written informed consent was obtained from the students before administration of the questionnaires. No stipends were given to the students.

RESULTS

Table 1: Socio-demographics of respondents

Variables	FrequencyN = 400	Percentage (%)
Age		
Mean ± Std	21.9 ± 3.6	
Age Categorised		
16 – 20 years	165	41.3
21 – 25 years	197	49.3
= 26 years	38	9.4
Sex		
Male	151	37.8
Female	249	62.2
Academic Level		
100 level	149	37.3
200 level	56	14.0
300 level	30	7.5
400 level	67	16.7
500 level	69	17.3
600 level	29	7.2
Marital status		
Single	383	95.7
Married	17	4.3
Fathers Highest Education		
No formal education	43	10.7
Primary	30	7.5
Secondary	65	16.3
Tertiary	174	43.5
Post graduate	88	22.0
Mothers Highest Education		
No formal education	37	9.3
Primary	21	5.3
Secondary	59	14.7
Tertiary	196	49.0
Post graduate	87	21.7
Sponsors		
Parents	351	87.7
Siblings	19	4.8
Relatives	30	7.5
Number of siblings		
<5	214	53.5
=5	186	46.5

A total of 400 medical students filled out the questionnaire completely. The mean age of respondents was 21.9± 3.6 years with the highest number of students (49.3%) within the age range of 21 to 25 years. The respondents were predominantly females (62.2%). The highest proportion of students was in 100 level (37.3%). Majority of the students were sponsored by their parents (87.7%). A greater proportion of the respondents had both male (81.8%) and female (85.4%) parents who had attained at least a secondary education. About half of the respondents (51.5%) had less than five siblings. (Table 1)

Table 2: Internet addiction among undergraduate medical students

Variable	Never	Rarely	Occasionally	Frequently	Always
How often do you stay online longer than intended	15 (3.8)	53 (13.3)	148 (37.0)	145 (36.3)	39 (9.8)
How often do you form new relationships with fellow online users?	39 (9.8)	167 (41.8)	117 (29.3)	67 (16.7)	10 (2.5)
How often do others in your life complain to you about the amount of time you spend online?	121 (30.3)	141 (35.3)	69 (17.3)	52 (13.0)	17 (4.3)
How often do your grades or school work suffers because of the amount of time you spend online?	151 (37.8)	142 (35.5)	70 (17.5)	30 (7.5)	7 (1.8)
How often do you check your social media account(s) before something else that you need to do?	29 (7.2)	74 (18.3)	127 (31.8)	134 (33.6)	37 (9.3)
How often do you fear that life without the internet would be boring, empty, and joyless?	89 (22.3)	76 (19.0)	70 (17.5)	96 (24.1)	69 (17.3)
How often does your productivity suffer because of the Internet?	128 (32.0)	120 (30.0)	89 (22.3)	48 (12.1)	15 (3.8)
How often do you fantasize about being online?	96 (24.0)	120 (30.0)	100 (25.0)	60 (15.0)	24 (6.0)
How often do you block out disturbing thoughtsabout your life with soothing thoughts of the Internet?	91 (22.8)	113 (28.2)	97 (24.3)	77 (19.3)	22 (5.5)
How often do you find yourself wanting to subscribe after your internet subscription has expired?	23 (5.8)	50 (12.5)	85 (21.3)	128 (32.1)	114 (28.5)
How often do you become defensive or secretive when anyone asks you what you do online?	126 (31.5)	138 (34.5)	54 (13.5)	60 (15.0)	22 (5.6)
How often do you feel annoyed or irritated if someone bothers you while you are online?	107 (26.8)	110 (27.5)	86 (21.5)	72 (18.1)	25 (6.3)
How often do you lose sleep due to the internet?	94 (23.5)	115 (28.7)	96 (24.0)	79 (19.8)	16 (4.0)
How often do you feel like you're missing out on the Internet when off-line?	79 (19.8)	111 (27.8)	86 (21.5)	79 (19.8)	45 (11.3)
How often do you find yourself saying "just a few more minutes" when online?	62 (15.5)	101 (25.3)	106 (26.5)	90 (22.6)	41 (10.3)
How often do you try to cut down the amount of time you spend online and fail?	60 (15.0)	87 (21.8)	119 (29.8)	89 (22.3)	45 (11.3)
How often do you try to deny how long you've been online?	96 (24.0)	109 (27.3)	87 (21.8)	82 (20.5)	26 (6.5)
How often do you choose to spend more time online over going out with others?	112 (28.0)	89 (22.3)	92 (23.0)	70 (17.6)	37 (9.3)
How often do you feel depressed, moody or nervous when you are off-line, which goes away once you are back online?	150 (37.5)	105 (26.3)	71 (17.8)	51 (12.7)	23 (5.8)

The highest proportion of respondents (37.0%) agreed that occasionally they stay online longer than intended. Eagerness to subscribe to the internet immediately subscription expires was always recorded among 28.5% of the respondents respectively. (Table 2)

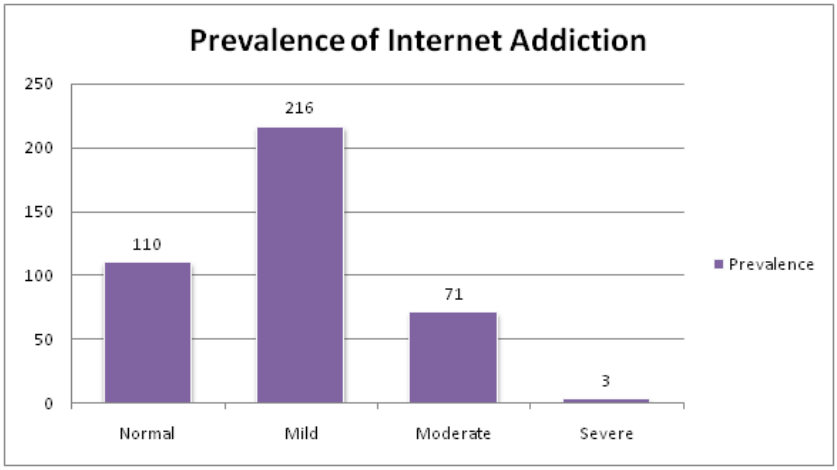

Figure 1: Prevalence of Addiction to Internet among Undergraduate Medical Students

In figure 1 above, 3 (0.8%) of the 400 respondents, were found to have severe IA, 71 (17.7%) were found to be moderately addicted, whereas more than half of the respondents 216 (64%) had mild addiction. The rest of the 110 students (27.5%) were not addicted to the internet.

Table 3: Predictors of Internet addiction among medical students

Variable	Addicted		p value from bivariate analysis*	AOR [95%CI]**
	Yes n=290	No n=110		
Age Categorised				
16 – 20 years	114 (39.3)	51 (46.4)	0.434	NA
21 – 25 years	148 (51.0)	49 (44.5)		
= 26 years	28 (9.7)	10 (9.1)		
Sex				
Female	173 (59.7)	76 (69.1)	0.082	1.379[0.849-2.240]
Male	117 (40.3)	34 (30.9)		1
Academic level				
>300	127 (43.8)	38 (34.5)	0.093	0.766[0.474-1.238]
= 300	163 (56.2)	72 (65.5)		1
Marital status				
Single	279 (96.2)	104 (94.5)	0.579	NA
Married	11 (3.8)	6 (5.5)		
Fathers Highest Education				
Primary	20 (6.9)	10 (9.1)	0.813	NA
Secondary	46 (15.5)	20 (18.2)		
Tertiary	131 (45.2)	43 (39.1)		
Post graduate	63 (21.7)	25 (22.7)		
No formal education	31 (10.7)	12 (10.9)		
Mothers Highest Education				
Primary	12 (4.1)	9 (8.2)	0.037	0.959[0.393-2.340]
Secondary	35 (12.1)	24 (21.8)		0.591[0.210-1.660]
Tertiary	152 (52.4)	44 (40.0)		0.578[0.279-1.197]
Post graduate	64 (22.1)	23 (20.9)		1.287[0.711-2.328]
No formal education	27 (9.3)	10 (9.1)		1
Sponsors				
Siblings	16 (5.5)	3 (2.7)	0.003	2.869[1.322-6.226]
Relatives	14 (4.8)	16 (14.5)		6.336[1.473-27.250]
Parents	260 (89.7)	91 (82.7)		1
Number of siblings				
<5	153 (52.8)	61 (55.5)	0.629	NA
=5	137 (47.2)	49 (44.5)		

AOR-Adjusted Odds Ratio at 95% Confidence Interval,** NA-Not Applicable (as only variables with p-value <0.2 at bivariate were logged into multiple logistic regression model)

Multivariate analysis reveals that students sponsored by their siblings were about three times more likely to be addicted to the internet (AOR= 2.869, CI= 1.322-6.226), than those sponsored by their parents. Likewise, students who were sponsored by the relatives (AOR= 6.336, CI= 1.473-27.250) had about six times the odds of being addicted to the internet when compared to their counterparts sponsored by their parents. (Table 3)

DISCUSSION

Internet addiction in this study ranged from 0.8% - 64.0%. A meta-analysis of the prevalence of IA in 31 nations across seven regions of the world generated an overall prevalence estimate of 6.0% with major differences across the world regions. (Kawabe et al. 2016) Severe addiction was reported in only 3 (0.8%) of the students in the present study. Similarly, severe IA has been reported in other studies among medical students where 0.3% and 0.8% of the respondents had severe IA. (Sharma et al. 2014; Anand et al. 2018) However, a Nigerian study among undergraduate students in different schools reported higher percentage of severe IA of 10.2%, 18.5% and 11.0% respectively. (Okwaraji et al. 2015; Akpunne et al. 2018; Okwaraji et al. 2015)These discrepancies could be due to the different instruments, classification methods used, or differences among the participants in the different studies.

Due to the compulsive way young people especially university students use the internet for various purposes; it may be very easy for them to get addicted to the internet. About 71 (17.7%) of the students in the present study had moderate level of IA. This was also similar to the report of an Indian study where 10.4% of the students had moderate IA. (Anand et al. 2018) However, a higher prevalence of 46.3%and 20.0% were recorded in similar studies conducted in India and Nigeria. (Okwaraji et al. 2015; Nath et al. 2016) Though both studies involved undergraduate students, the availability of resources for internet access and the rate of internet use in the general population may account for the difference noted. Although the proportion of the students with severe and moderate IA is low in this study, the proportion with mild addiction is worrisome as these constitute a high-risk group that if unchecked, can progress to severe IA over time.

In the present study, about one quarter (26.8%) of students stated that their academic performance was affected by excessive internet use. In a similar study among medical students about one-third of students declared that their attendance and concentration at class has been affected by excessive internet use. (Taha et al. 2019)This poor academic performance following excessive use of the internet has also been reported among students in similar studies carried out in Lebanon, Kuwait, United States and European countries. (Samaha et al. 2016; Al-Menayes, 2015; Karpinski et al. 2013) Excessive use of the internet can lead to deterioration in academic performance and possibly drop-out from medical school.

About half (47.8%) of the students in the current study felt that excessive internet use had affected their sleep. Lack of sleep; not meeting up to the recommended 7 – 9 hours daily drains your mental capabilities and puts your physical health at great risk.This finding is in-line with various studies that found that excessive internet use can lead to sleep disorders, depression, poor academic/work performance and weight gain. (Taha et al. 2019; Lack, 2011; A'lamElhuda et al. 2014; Mohammadbeigi et al. 2016) Our study also reported that about 46% of the students fantasize about being online and this was comparable to the report of a similar study where 41.1% of the respondents feel preoccupied online than offline. (Shek et al. 2012) Also 81.3% of the students stay online longer than initially intended. A study conducted in Hong Kong reported lower periods of internet usage. (Shek et al. 2012).

The predictors of IA were mother's highest educational level and educational sponsors. The internet has a major role to play in the world of academics today. Mothers who are educated understand this and will encourage frequent use of the internet; the higher the level of education, the more their children and wards are expected to regularly use the internet. Likewise, mothers with higher level of education are expected to have higher income hence can afford to provide additional money for their children to purchase data believing that its benefit is immeasurable.

However, findings from a study of IA across the globe, has shown that IA is associated with low level of family income. (Cheng et al. 2014) Students who are not sponsored by their parents fall into this category of individuals, hence it corroborates the finding in the present study. Also, students not sponsored by their parents are not expected to have the financial capacities like those sponsored by their parents hence will find it cheaper reaching significant others through internet calls or other social media platforms especially where internet services are readily available. Those students whose education is sponsored by their relatives are more likely to live in hostels and rented apartments unlike those sponsored by their parents. Findings from a multi-center study have shown that students living in the hostels and rented apartments are more likely to get addicted to the internet when compared with those living with their families. (Anand et al; 2018) This may be because students living with their parents are closely monitored and are more involved in family life activities like participating in house chores unlike those who live alone in the hostel.

CONCLUSION

This study shows the prevalence of IA among undergraduate medical students in Enugu state is high, though only 0.8% was severely addicted to the internet. With increasing reliance on the use of internet especially among young people, the risk of IA is inevitable. Mild IA if left unchecked can progress to severe IA. More comprehensive evaluations should be employed routinely among the students as dependency on the internet given the current technological trends, proliferations of smart gadgets and globalizations is a precipitating factor to IA.

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