

Internet addiction and perceived sleep quality amongst undergraduate students in Obafemi Awolowo University Ile-Ife, Nigeria

Funmito Omolola Fehintola, Taofeek Aanuoluwapo Hassan, Ismail Abidemi Kolapo, John Oluwale Kolawole* and Adesanmi Akinsulore

Obafemi Awolowo University, Ile-Ife, Nigeria

*Corresponding Author: joak4christ@gmail.com

Abstract

Background: In this “internet age” studies worldwide have shown that internet addiction is an emerging global problem of increasing internet usage in the 21st century. The significant association between internet addiction and poor sleep quality as documented in different studies is particularly worrisome, since poor sleep has harmful consequences on the individual.

Objective: The aim of this study was to assess internet addiction and sleep quality of a sample of Nigerian undergraduate students.

Method: This research used a descriptive cross sectional study design as well as a multi-staged sampling technique, employing pretested self-administered questionnaires (with sections for socio-demographics. Young’s Internet Addiction Test and Pittsburgh Sleep Quality Index) to obtain data from undergraduate students of OAU, Ile-Ife.

Results: study participants Among the study participants, 74.6% have internet addiction (36.6% mild; 35.1% moderate; 2.9% severe); 65.2% have poor sleep quality. There was significant association between internet addiction and sleep quality (p-value 0.042), as well as between internet addiction and habitual smartphone use close to sleep time, and alcohol or tobacco use (both with p 0.001).

Conclusion: There is a high prevalence of internet addiction and poor sleep quality amongst undergraduate students.

Keywords: Internet addiction, sleep quality, mental health, undergraduates, smartphone

Introduction

It has been stated that: “The internet is a worldwide system of computer networks; a network in which users at any one computer can, if they have permission, get information from any other computer (and sometime talk directly to users at other computers” (Turow, 2009).

The beginning of the 21st century is popularly dubbed the gateway into the internet age, arriving on the back of the earlier invention of the computer; subsequent invention of the smartphone has made internet access even easier and its use more wide-spread. However, this modern tool is not without its fair share of concerns and controversies.

By 2015, approximately 3.2 billion people, or nearly half of the world’s population, were estimated to have access to the internet (Khan and Dennis 2019). People use the internet for various activities: information and academics, business, messaging, entertainment and socialising (Ogbomo and Ivwighrehweta 2016).

Internet addiction is characterised by excessive or poorly-controlled preoccupations, urges or behaviours regarding computer use and internet access that lead to impairment or distress. Various other eponyms have been coined to describe this condition, viz.: problematic internet use, pathological internet use, internet dependency, internet mania (Shaw and Black, 2008).

This condition has been found to be predominant in the young people, particularly those in the 3rd and 4th decades of life (Shaw and Black 2008); this is unsurprising since adolescents and young adults have been found to use the internet the most (WHO 2014).

A number of problems have been associated with this phenomenon, particularly psychosocial impairments, including self-reported sleep problems, anxiety, depression, stress, self-esteem issues (Younes et al. 2016); social interaction issues (Akanbi et al 2018); poor academic performance and cyber-bullying (WHO 2014).

Sleep is a state of unconsciousness in which the brain is relatively more responsive to internal than external stimuli (Bollu 2019). Sleep is a state in which an organism temporarily, partially and periodically loses its interaction with its surrounding. It is of different stages and intensities. It can be reversed with appropriate stimuli (Saygin et al. 2016).

Sleep is a biological requirement of human life (Siddiqui et al. 2006, cited in Gregory, Xie and Mengel 2004). It is important for maintaining good physical, mental and emotional health (Siddiqui et al. 2016 cited in Colten and Altevogt 2006). Adequate sleep is necessary for optimal cognitive functioning, consolidation of memory and optimal daytime activity, all of which are important requirements for productivity especially of young people.

The increasing prevalence of internet addiction and the significant association between internet addiction and poor sleep quality documented in the different studies is particularly worrisome especially pertaining to the young people who are expected to be a major backbone of the productive capacity of any nation, since poor sleep is harmful to the body with negative consequences such as tiredness, reduced concentration, increased risk of accidents and overall poor daytime activeness.

Quite a number of studies in many countries including USA, UK, Switzerland, Korea, China, India, Turkey, Saudi Arabia, Iran, South Africa have examined the question of internet addiction; a few of those studies have also investigated its association with sleep.

However, very few indigenous studies are available in Nigeria on the topic of internet addiction, as most of the studies were conducted in Asia and Europe (WHO 2014), and practically none examining its relationship with sleep; thus creating a need to fill this knowledge gap. The aim of this study, therefore, is to assess internet addiction and perceived sleep quality of undergraduate students of Obafemi Awolowo University, Ile-Ife.

Materials and Methods

The study was conducted in Obafemi Awolowo University, Ile-Ife, Nigeria, a federal government owned university located in Ife Central Local government area of Osun State, South-west Nigeria (Wikipedia 2019). The university has 13 faculties and two colleges - the postgraduate college and the college of health sciences. It has more than 80 departments, about 35,000 students and 5,000 staff. The students' residential areas are made up of eight undergraduate halls and a postgraduate hall. The male undergraduate halls of residence include Awolowo Hall, Angola hall, Fajuyi hall and ETF hall while the female undergraduate halls of residence include Alumni hall, Moremi hall, Ladoke Akintola hall and Mozambique hall. The postgraduate hall, Murtala Muhammed hall is a mixed hall (Obafemi Awolowo University 2019).

This research employed a descriptive cross-sectional study using a quantitative method to gather information from Obafemi Awolowo University male and female undergraduate students. The study included male and female undergraduate students who were living in the university hostels and were willing to take part in the study and excluded postgraduate students, students who were unwilling to participate in the study, those who were not using the internet and those living off campus at the time of the study.

The sample size was calculated using the Leslie Fischer's formula: $n = Z^2 P(1-P)/d^2$

Where n is sample size; P is crude estimate of prevalence from previous similar study (0.486) (Adeniy et al. 2020); d is maximal allowable margin of error (0.05); Z is standard normal deviate (set at 1.96 which corresponds to nine confidence level for a two tailed test). In order to account for the anticipated loss in data collection, a 90% response rate; thus a 10% non-response rate was added. The final adjusted sample size was 422.25, approximately **423**. Out of the 423 questionnaires that were administered, 382 were correctly completed giving a response rate of approximately 90%.

A multi-staged sampling technique was used: in stage 1, four out of Eight halls of residence were selected by simple random sampling. We selected two male and two female halls through balloting. The selected halls included Awolowo, Fajuyi, Moremi and Akintola hall. In stage 2, two blocks were selected from each hall of residence by balloting. Stage 3, the self-administered questionnaires were systematically administered to the students in the selected blocks in each hostel on alternate room basis beginning from the first room. The number of participants per hostel was calculated based on proportion with respect to the total number of students in each hostel.

A pretested self-administered questionnaire was employed. The questionnaire had three sections. **Section A** contains information about the sociodemographic characteristics of the study participants, which includes age, gender, ethnicity, marital status, religion, faculty, department, level, place of residence, average monthly allowance, father's occupation and mother's occupation. It also contains information to know if they take tobacco or alcohol or have the habit of smartphone use before sleep. **Section B** contains the Younger's Internet Addiction Test (IAT) questionnaire. **Section C:** Contains questionnaire on sleep quality- Pittsburgh Sleep Quality Index which was validated for use in Nigeria (Aloba et al., 2007).

The IAT questionnaire consists of 20 questions each graded 0-5. The total score is grouped into different levels of addiction: 0-30 = no addiction; 31-49 = mild addiction; 50-79 = moderate addiction; 80-100 = severe addiction. The PSQI Consists of 7 components: a global PSQI score is obtained by addition of all components. This is then grouped into two categories: 0-4 = Good sleep quality; 5 or more = Poor sleep quality. The data was analyzed using Statistical Package for Social sciences software (IBM SPSS 20.0 version) and results presented in tables. Univariate analyses used included frequency distribution (for categorical variables like sex), mean and standard deviation (for continuous variables like age). Bivariate mode of analysis used was chi square statistics to

determine associations between internet addiction and sleep quality, as well as between internet addictions, sleep quality and various sociodemographic variables.

Ethical approval was sought from the research and ethics committee of the Institute of Public Health (IPH), OAU, Ile Ife (IPHOAU/12/1360). Written consents were obtained from respondents during the filling of questionnaires and they were assured of the confidentiality of their response.

Results

Table 1 shows the sociodemographic characteristics of the study participants: 69.6% of the study participants were between the ages of 20-24years; 63.4% were males while 36.6% were females. 89.5% were Yorubas while 10.5% belonged to other tribes. Most of the study participants were single (99.2%) and majority were Christians (88.7%).

Table 1: Socio-demographic characteristics of study participants

Variable	Category	Frequency	Percentage
Age group (Years)	16-19	89	23.3
	20-24	266	69.6
	25-29	27	7.1
	Total	382	100
Gender	Male	242	63.4
	Female	140	36.6
	Total	382	100
Ethnicity	Yoruba	342	89.5
	Others	40	10.5
	Total	382	100
Marital status	Single	379	99.2
	Married	3	0.8
Religion	Christian	339	88.7
	Islam	40	10.5
	Others	3	0.8
	Total	382	100
Level	100	35	9.2
	200	51	13.4
	300	77	20.2
	400	179	46.9
	500	40	10.5
	Total	382	100
Facility group	Health sciences and pharmacy	76	19.9
	Science and Agriculture	77	20.2
	Arts, Law and Education	57	14.9
	Administration, Technology	65	17
	Environmental design and Mgt	107	28
	Total	382	100
Hall of residence	Awolowo.	120	31.4
	Fajuyi.	121	31.7
	Moremi	95	24.9
	Akintola	46	12
	Total	382	100

Smartphone use one hour before sleep: Most of the study participants (78.5%) have the habit of smartphone use one hour before sleep in the past 6 months. Table 2 shows the prevalence of internet addiction among the study participants: Majority had

internet addiction of varying levels (Mild- 36.6%, Moderate- 35.1%, and Severe- 2.9%). Table 3 shows the sleep quality of the study participants: More than half of the participants (65.2%) had poor sleep quality; only 34.8% had good sleep quality.

Table 2: Smart phone use before sleep and prevalence of internet addiction

Variable	Frequency	Percentage
Smart phone use one hour before sleep (Five nights per week in the past six months)		
Yes	300	78.5
No	82	21.5
Total	382	100
Level of Internet Addiction		
None	97	25.4
Mild	140	36.6
Moderate	134	35.1
Severe	11	2.9
Total	382	100

Table 3: Sleep quality

Variable	Frequency	Percentage
Sleep Quality		
Good	133	34.8
Poor	249	65.2
Total	382	100

Table 4 shows the relationship between smartphone use one hour before sleep and level of internet addiction: 78.3% of those who have a habit of smartphone use one hour before sleep have internet

addition while 61.0% of those who do not have this habit of smart phone use one hour before sleep have internet addiction (p-value of 0.001, which is statistically significant).

Table 4: Smartphone use and level of internet addiction

Variable	Level of Internet Addiction		Statistics		
	No addiction. Frequency (%)	Addiction Frequency (%)	X ²	df	p-value
Smartphone Use					
Yes	65(21.7)	235(78.3)	10.242	1	0.001
No	32(39.0)	50(61.0)			

Table 5 shows the relationship between internet addiction and sleep quality of the study participants: 68.1% of those who have internet addiction have poor

sleep quality compared to those who do not have internet addiction of which 56.7% had poor sleep quality (p-value of 0.042 which is statistically significant).

Table 6: Internet Addiction and Sleep Quality

Variable	Sleep Quality		Statistics		
	Good Frequency (%)	Poor. Frequency (%)	X ²	df	p-value
Internet Addiction					
No Internet Addiction	42(43.3)	55(56.7)	4.122	1	0.042
Internet Addiction	91(31.9)	194(68.1)			

Discussion

In the present study, the level of internet addiction and sleep quality amongst undergraduate students of OAU Ile-Ife, as well as the relationship between the two was assessed. The study showed that nearly three-quarters of the study participants (74.6%) had internet addiction (36.6% mild; 35.1% moderate; 2.9% severe); well over half of them (65.2%) had poor sleep quality. There was also significant association

between internet addictions and sleep quality (p-value 0.042). Likewise, internet addiction was found to be significantly associated (p-value 0.001) with habit of smartphone use close to sleep.

The use of smartphone among students has increased drastically with improvement in technology and internet access. Nearly three-quarters of the study participants (74.6%) have internet addiction (36.6%

mild; 35.1% moderate; 2.9% severe). This is very similar to what Khayat et al. (2018) found - 74% (mild in 42.3%, moderate in 29.9% and severe in 1.8%), but quite higher than values reported by Okwaraji et al. (2015) at 59% (29% mild, 20% moderate, 10.2% severe) Akpunne and Akinnawo (2018) found a prevalence of 48.6% (30.1% moderate, 18.5% severe). Notwithstanding, all these values are significantly higher than values reported in nationally-based studies e.g., 18% in the UK; 7-23% in Hong-Kong; and figures as high as 26% in the USA (WHO, 2014); this is not surprising since these studies may have included participants of various age groups and other sociodemographic characteristics.

Sleep is one of the essential needs of all humans. Adequate sleep is important for students because it is germane for critical thinking, good academic performance and the overall physical and mental well-being. Most of the study participants (65.2%) had poor sleep quality. Abolghasem et al. (2016) found 32.5%, Khayat et al. (2018) found 54.4%. The value in the present study may have been significantly higher than those reported in similar studies due to the fact that the sample population (the students of Obafemi Awolowo University) where in the period of examination as at the time of data collection; the stress of the exam period could have adversely affected their sleep quality; even though it was attempted to address this limitation by urging the students to base their response on their routine activities outside the exam period.

The study also showed that most of the study participants (78.5%) have the habit of smartphone use one hour before sleep, which is slightly lower when compared to the value (92.4%) which Alshobaili and Alyousefi (2016) found in their study in Saudi Arabia. Internet addiction was found to be significantly associated (p -value 0.001) with habit of smartphone use close to sleep, which is similar to Chaudhari et al. (2015) who found that using mobile phone or internet access was significantly associated with internet addiction.

Despite the numerous benefits of the internet, addiction to internet has impacted negatively on students. There was significant association between internet addictions and sleep quality (p -value 0.042). Khayat et al. (2018) similarly concluded that sleep problems and poor sleep quality among university students were related to high internet use. Khayat et al. (2018) and Nagori et al. (2019) found a significant association between internet addiction and poor sleep quality in a group of selected students. Gradisar et al. (2013) found a significant relation of evening technology use with sleep, where the quality of sleep and sleep latency were both affected by technology

use in the hour before bedtime. In the study by Yang et al. (2015) in Taiwan, the sleep quality of over half of the college students was found to be adversely affected by the use of internet for chatting, playing games, and watching movies before sleeping.

Similarly, Mohammadbeigi et al. (2016) in their study investigating the correlation between internet use and sleep in 380 medical students concluded that overuse of mobile phones and social networks could impair sleep quality.

Limitations of study

As with all cross-sectional surveys, this study is subject to response bias and frantic efforts were made to reduce this to the barest minimum by assuring study participants of confidentiality of their sincere response. Furthermore, data was collected from students at a time they were just coming off the back of a month's long examination period; effort was made to limit possible effect of this on their response by urging them to base their response on their routine daily activities outside the exam period.

Conclusion

From this study, majority of undergraduates are addicted to the internet. Likewise, majority of undergraduates have poor sleep quality. There is significant association between internet addiction and sleep quality of undergraduates.

Recommendations

From the outcome of this study, It is recommend that; Awareness should be raised amongst undergraduates about the problem of Internet Addiction; Students should be educated on the importance of good sleep quality on their health; Undergraduate students should be further educated on the negative impacts of internet addiction on their sleep. Further research should be carried out to identify other effects as well as determinants of internet addiction.

Acknowledgements

The authors wish to acknowledge and appreciate all the study participants who took part in this study. We also appreciate everyone who encouraged and motivated us during the course of this study.

Conflict of interest

The authors declare that there is no conflict of interest.

Funding

There is no external source of funding for this research.

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