

INVESTIGATION OF INTERNET ADDICTION AND INTERPERSONAL RELATIONSHIP AMONG UNDERGRADUATE STUDENTS

Rukayat Oyebola IWINTOLU,

Department of Arts & Social Science Education, Osun State University, Osogbo, Nigeria,
rukayat.iwintolu@uniosun.edu.ng

Ramota Ajoke RASAQ,

Department of Educational Foundations & Counselling, Obafemi Awolowo University, Ile-Ife, Nigeria.

Kayode Ayodeji ALAO,

Department of Educational Foundations & Counselling, Obafemi Awolowo University, Ile-Ife, Nigeria.

Abstract: *The study investigated internet addiction and interpersonal relationship among undergraduates' students in Nigeria. Four research questions guided the study. The study employed descriptive research design. The population consisted of undergraduate students of Osun State university. Stratified and simple random sampling was used to select 200 respondents across nine (9) departments in two colleges. An adapted questionnaire from Internet Addiction Test (IAT) and Interpersonal Solidarity Scale (ISS) was employed for the study. The results of the findings indicated that internet addiction is moderate among undergraduates. The result also showed age, level, course and religion do not significantly influence internet addiction of undergraduates. However, gender significantly influences internet addiction. The result also indicated that personal relations, interpersonal relationship, means of surfing the internet and place of residence does not significantly predict students' internet addiction. Finally, the result concluded that, the more undergraduates become addicted to the internet, the lesser the level of interpersonal relationship. It is thus recommended that, internet addiction awareness should be created among undergraduates in Osun State University through seminars, workshops among others.*

Key words: *internet addiction; computers; interpersonal relationship; undergraduates.*

Introduction

Currently, Nigerian university students have shown a strong interest in the intangible world of the internet (Internet Live Stats, 2016, Tejumaiye, et. al, 2018, Ubogu & Chukwusa, 2022). The internet is an expansive computer network that links together millions of computers, establishing it as the biggest network of its type on a worldwide scale. The internet technology enables the connecting of several computers, enabling the transport of data across servers (Aririguzoh, et. al, 2018). In the early days, most people used the internet primarily for information retrieval; while the modern internet is a versatile tool that includes a wide variety of information and provides new ways to access, interact with, and connect persons and material. Ogbomo & Ivwighreghweta, 2016, Adorjan, et. al, 2021, Sanchez-Fernandez, et. al, 2023, Nađsombat & Tomičić 2023 asserted that university students utilize the internet to share information and engage in social media communication, and have compulsive behaviors towards its use.

The shift from face-to-face contacts to online relationships seems to be a result of the advantages linked to internet use, even though, eventually resulting in the emergence of internet addiction (Kuss & Pontes 2018; Joorabchi, et al, 2022). The term "addiction" is derived from the Latin word "addictus", which refers to an individual's excessive dedication to a certain activity or drug, leading to a reduced ability to make independent decisions or operate independently (Rosenthal, & Faris, 2019, Heilig, et. al., 2021). Traditionally, addiction has been described as the use of psychoactive chemicals that may temporarily alter the chemical balance of the brain by crossing the blood-brain barrier. This category includes alcohol, tobacco, and certain medications (Ofole & Babatunde, 2015, Pimentel, et al., 2020).

Internet addiction refers to an uncontrollable need to participate in online activities to the point that it interrupts normal daily routines and may negatively affect personal connections with loved ones. Internet addiction is defined as the inability of a person to control or manage their online use. The disorder has been described as a complex syndrome that manifests with cognitive and behavioral symptoms, as recorded in several sources (Lin, et. al. 2014, Okwaraji, et. al. 2015). This manifest in various forms and dimensions such as, teenagers consistently isolating themselves in their rooms or avoid in-person interactions in order to spend more time on the internet, (Aririguzoh, et. al, 2018, Mengin, et al. 2020, Turner, et al. 2024). Needless to stress that problem of internet addiction among young people necessitates substantial public attention. In the last ten years, there has been a notable increase and spread of new forms of internet-based information and communication technologies, such as social media, personal computers, mobile or cellular phones, and other similar devices (Ballarotto, et. al, 2018, Haleem, et al., 2022). The

demographic group of teenagers and young adults is the biggest group of people who utilize the several technologies (Ballarotto, et. al, 2018, Abi-Jaoude, et al, 2020). The emergence of information technology, namely the extensive use of internet-based social media platforms like Whatsapp, Facebook, WeChat, and Instagram, has greatly altered the realm of interpersonal communication in recent years (Smith & Anderson, 2018, Stone & Wang, 2018, Hou, et. al. 2019).

According to Jhangiani & Tarry, 2022, relationship refers to a dynamic between two persons where their actions depend on each other. This means that if one person changes their behavior, it is anticipated to cause a corresponding change in the behavior of the other person. Interpersonal connections may be described as the formation of a link or affiliation between two or more persons, taking into account certain elements. The length of a relationship may vary greatly, ranging from a short amount of time to a whole lifetime, depending on a multitude of circumstances. Humans are inherently social organisms and need social connection in order to flourish. Developing healthy interpersonal interactions is crucial for enhancing both physical and emotional well-being. It is crucial for people to be aware of how their ideas, words, behavior, and actions affect their relationships.

Interpersonal interactions are the essential elements of all human communities. Verbal or symbolic communication enables the formation of new connections. Insufficient, below-average, or unsuitable communication may result in the decline of relationships. The quality of social relationships has a considerable impact on the quality of societies, since the understanding of the world is molded by our capacity to interact successfully with others who are nearby. In settings characterized by liberty and transparency, people are inclined to participate in unrestricted communication. Therefore, it seems that those with a propensity for addiction are attracted to the internet because it has the ability to relieve the pressures of social situations (Neverkovich, et. al., 2018, Chemnad, et al, 2023). An analysis has shown that Social Networking Sites (SNSs) have an impact on the interpersonal connections of teenagers, by improving their interactions with each other, thereby promoting both bridging and bonding social capital. Adolescents show a strong preference for using SNSs and cannot imagine a world without them, as they have become an essential part of their everyday lives. The study suggests that SNSs have both promoted the strengthening of ties among close teenage friends and impeded the formation of interpersonal connections with acquaintances who are not part of their inner circle. It indicates that teenagers have had limitations in participating in face-to-face contact, especially with members of the opposing sex, which has hindered their capacity to express themselves (Liu, et al, 2023).

While the internet has been discovered to possess a multitude of advantageous features, such as greater global reach, improved virtual connections, access to limitless information among others. The importance of social ties made by undergraduate students on their physical, social, psychological, and behavioral well-being in both the short and long term is generally recognized. The exploration of internet addiction among undergraduate students and its effects on their personal, social, and family interactions has been lacking, especially in this specific area. The present study endeavours to examine the impact of internet addiction on the interpersonal relationships of undergraduate students enrolled at Osun State University, located in Osogbo, Nigeria.

Research question formulations

Prevalence of internet addiction

Prevalence refers to the proportion of a population exhibiting a specific characteristic within a defined period. Okwaraji et al. (2015) assessed 510 Nigerian university students for internet addiction and depression, revealing that 29.0% had mild internet addiction, 20.0% moderate addiction, and 10.2% had severe addiction. Similarly, Ogbomo and Ivwighreghweta (2016) found significant internet reliance among undergraduates, with 91.2% accessing it via mobile phones. Akin (2017) reported that 0.61% of adolescents exhibited compulsive internet use, and 39% spent 5-6 hours online daily.

Omoyemiju and Popoola (2021) noted that 14% of students showed severe internet addiction. Further, Kokka et al. (2021) and Wang et al. (2023) found that 96.8% of young people used the internet daily. Studies by Ibrahim et al. (2022), Mahama et al. (2024), and Mohamed et al. (2024) reported a 13.1% prevalence rate of internet addiction, with 73.1% classified as over-users, 29.4% demonstrating high curiosity, and 35.6% with low addiction levels. Amano et al. (2023) found a 53.6% prevalence among participants. Ogboghodo et al. (2024) surveyed 499 respondents, 78.6% of whom were addicted, with 90.8% showing mild, 8.9% moderate, and 0.3% severe addiction.

This research aims to address the question below:

RQ 1: What is the level of prevalence of internet addiction among undergraduates?

Influencing characteristics of internet addiction

Estimating internet addiction requires consideration of influencing factors that may moderate addiction levels among students. Okwaraji et al. (2015) identified significant gender differences in internet addiction and depression. Similarly, Omoyemiju and Popoola (2021) and Ogboghodo et al. (2024) confirmed a significant association between male gender and internet addiction. Other studies (Agbaria & Bdier,

2021; Arya et al., 2018; Xin et al., 2018) reported higher addiction levels among males compared to females. Conversely, Ogbomo and Ivwighreghweta (2016) and Şan et al. (2024) found no notable gender differences in addiction levels.

Regarding age, Arya et al. (2018) and Agbaria and Bdier (2021) observed higher addiction rates among younger students compared to older ones. Ogboghodo et al. (2024) highlighted significant differences in addiction by academic level, with lower-year students showing increased values. On religion, Agbaria and Bdier (2021) found no significant differences in internet addiction. However, research addressing the relationship between addiction and students' courses of study remains limited.

Given these findings and gaps in the literature, this research seeks to explore how various factors influence internet addiction and addresses the research question below:

RQ 2: What influence do the students' demographic characteristics (gender, age, academic level, course of study and religion) have on the internet addiction of students?

Predictive measures of internet addiction

Akanbi et al. (2018) highlighted that excessive internet use can lead to psychosocial consequences, such as forming new online relationships, higher financial costs, and spending more time online at the expense of social activities. Additionally, Hao et al. (2022) found a positive correlation between internet addiction (IA) and challenges in interpersonal relationships, including difficulties with conversation, making friends, social interactions, and heterosexual communication. Nwufo et al. (2023) observed that poor family functioning was significantly linked to greater internet addiction ($\beta = .13$). These findings underscore the prevalence and risk factors of IA among adolescents in sub-Saharan Africa.

Yu and Shek (2018) suggested that poor personal well-being in adolescents often results from, rather than causes, internet addiction. Omoyemiju and Popoola (2021) noted higher IA rates among students living on campus, while Agbaria and Bdier (2021) found no significant differences in addiction based on residence. However, research on the means of internet access remains limited.

These findings emphasize the multifaceted nature of IA, its impact on personal and social well-being, and the gaps in understanding related variables. This study aims to explore these dimensions further, addressing the research question below:

RQ 3: Can the internet addiction of students correctly be predicted by measures of personal relationship, social relationship, family

relationship, and interpersonal relationship, place of residence and means of surfing the internet?

Method

The research design utilized in this study was a descriptive survey. This entailed conducting a study on a population or set of objects through the acquisition and examination of data from a limited number of representatives (i.e., a sample) of the entire population. The study was conducted on a population consisting of undergraduate students from Osun State University in Osogbo, Nigeria. The researchers employed a stratified random sampling technique to choose participants from nine distinct departments within the colleges. This method was employed to identify sub-populations and subsequently incorporate them into the sample. Subsequently, the utilisation of the simple random sampling method was implemented in order to select a sample size of 200 participants for the purposes of this investigation. The utilisation of random sampling was implemented due to its capacity to allow for the inclusion of each individual in the sample.

Data collection was conducted using self-administered standardized questionnaires. The study used a quantitative methodology to collect data, using a single research tool that included standardized measurements. The research was titled "Internet Use and Interpersonal Relationship Questionnaire (IUIRQ). The IUIRQ is a survey consisting of 42 questions, which are categorized into three components. Section A gathered data on the respondents' general information. The gathered data includes demographic factors such as gender, level of education, and age. Section B consisted of 20 questions that evaluated the extent of internet addiction. The assessment of online addiction was carried out using the online Addiction Test (Young, 1998).

The Internet Addiction Test (IAT) was created by (Young, 1998) as a reliable and accurate instrument for evaluating addictive behaviors of Internet use. There are a total of twenty individual components stated above. The Implicit Association Test (IAT) has shown robust psychometric features, affirming its reliability and validity as an assessment tool. Consequently, it has been used in subsequent research related to addiction (Young, 1998). The tool evaluates people' level of involvement with the computer and classifies addictive inclinations into mild, moderate, and severe degrees of addiction. The scale used for measuring is a six-point Likert scale, with values ranging from 0 (showing non-applicability) to 5 (representing a high frequency of occurrence). The numbers 1, 2, 3, and 4 reflect different degrees of frequency between the two extremes. Section C comprised 15 items that assessed the interpersonal relationships of the participants. The measurement process involved the utilisation of representative items that

were extracted from the Interpersonal Solidarity Scale (ISS), which was originally developed by Wheelless, 1976.

The Interpersonal Solidarity Scale is a tool utilised to gauge the degree of emotional proximity that arises among individuals due to shared sentiments, similarities, and intimate behaviours. Theoretically, individuals who possess strong feelings of solidarity are also likely to exhibit trust, fondness, and self-disclosure towards one another. A total of 15 items were extracted from the initial scale comprising 30 items. The extracted items encompassed personal, social, and familial relationships, all of which assessed the interpersonal relationships of the participants. The survey instrument employed a response format based on the Likert scale, consisting of four points ranging from strongly disagree to strongly agree. The scale comprises various items, such as experiencing difficulty in relying on others and finding it effortless to establish emotional intimacy with others.

The instrument's reliability coefficient was assessed through the utilisation of Cronbach Alpha, resulting in a coefficient value of 0.85. The data collected in this study were processed using the Statistical Package for Social Sciences (SPSS) Version 25. Both univariate and multivariate statistical analysis tools were employed, including frequency counts, percentages, binary logistic regression analysis, and chi square at a significance level of 0.01.

Results

Research question 1: what is the level of prevalence of internet addiction among undergraduates?

To answer this research question, the scores of the students on internet addiction were pooled together and categorised. To categorise the students' scores, the descriptive statistics of the scores were obtained. The minimum score was 24, maximum score was 99, the mean was 60.90 and standard deviation was 16.52. The scores that ranged between the minimum obtained score and the mean score minus SD (24 - 53) represented "Mild Addiction"; scores that ranges from above the mean minus SD and the mean plus SD (54 - 86) stand for "Moderate Addiction" and scores that ranged from mean plus SD and the maximum score (87 - 99) represent "Severe Addiction". The results are presented in Table 1.

Levels	Frequency	Percent
Mild	31	15.5
Moderate	140	70.0
Severe	29	14.5

Table 1: Level of internet addiction

Table 1 showed the level of internet addiction of undergraduate students. It revealed that most of the respondents (70%) demonstrated a moderate level of internet addiction; followed by 15.5% of the respondents that demonstrated a mild level of internet addiction and 14.5% exhibit a severe level.

Research question 2: what influence do the students' demographic characteristics (gender, age, academic level, course of study and religion) have on the internet addiction of students?

To answer this research question, the influence of respondents' demographic characteristics, in terms of their gender, age, academic level, course of study and religion on internet addiction were examined using the chi-square statistics test of association. The results are presented in Table 2.

	Level of internet addiction			Total	χ^2	P
	Mild	Moderate	Severe			
Sex						
Male	6 (8.22)	47 (64.38)	20 (27.40)	73	17.6	0.0
Female	25 (19.69)	93 (70.31)	9 (7.09)	127		
Age						
15-19	1 (5.0)	16 (80.0)	3 (15)	20 (10.0)	7.02	0.3
20-24	18 (21.6)	53 (63.6)	11 (13.41)	82 (41.0)		

25-29	1(5.0)	17 (85.0)	2 (10.0)	20 (10.0)		
	y					
	e					
	a					
	r					
	s					
30-34	11	54	13	78 (39.0)		
	y					
	e					
	a					
	r					
	s					
Course						
ECO	5 (12.5)	27 (67.5)	8 (20.0)	40 (20.0)		
EDM	4 (14.29)	16	8 (28.57)	28 (14.0)		
		(5				
		7.				
		1				
		4)				
ENG	8 (13.79)	39	11 (18.97)	58 (29.0)		
		(6				
		7.				
		2			16.0	0.0
		4)				
GDC	5 (21.74)	18	0	23(11.5)		
		(7				
		8.				
		2				
		6)				
POL	7 (15.90)	35	2 (4.55)	44 (22.0)		
		(7				
		9.				
		5				
		5)				
BOE	2 (28.57)	5 (71.43)	0	7 (3.5)		
Level						
100	22	106		151		
	(1	(7		(
	4.	0.		7		
	5	2		5	0.57	0.7
	7)	0)	23 (15.23))		
200	9 (18.27)	34	6 (12.24)	49 (24.5)		
		(6				
		9.				

Religio		n		3		9)	
Christia	38						
n			(7				
i			4.				
t			5				
y	8 (15.69)		1) 5 (9.80)		51 (25.5)	1.24	0.5
Islam	23	102	24		149		
	(1	(6	(1	(
	5.	8.	6.	7			
	4	4	11	4.			
	4)	5))	5			
)			

Table 2: Influence of students' demographics on internet addiction

Legend

ECO – Economics Education; EDM – Educational Management; ENG – English Education

GDC – Guidance and Counselling; POL – Political Science Education; BOE – Biology Education.

The results in Table 2 revealed that only the sex of the respondents significantly influence internet addiction of undergraduate students. It showed that age, course, level and religion do not significantly influence the internet addiction of undergraduate students.

Research question 3: Can the internet addiction of students (“Not addicted” or “addicted”) be correctly predicted by measures of personal relationship, social relationship, family relationship, and interpersonal relationship, place of residence and means of surfing the internet?

To answer this research question, the dependent and independent variables were subjected to binary logistic regression analysis which was entered at once, but each is evaluated and assessed in relationship to the dependent variable. The results are presented in the table below.

A total of 200 cases were analyzed and the full model significantly predicted that students will be addicted to the internet (Omnibus Chi-square = 213.134, df = 6; $p < 0.01$) and the associated significance level shows that the model significantly predicts group membership. The model also accounts for between 65.6% and 87.5% of the variance using Cox & Snell R square and Nagelkerke R square; and correctly predicts the outcome for 95.2% of the cases (-2 log likelihood = 63.625). However, only 52.5% not addicted to the internet was correctly predicted. Overall, 95.0% of predictions were accurate.

	B	S.E.	Wald	D	Sig	95% C.I.for EXP (B)	
						Exp(Low	Upper
Step 1 ^a Personal	-.013	.266	.003	1	.96	.987	.586 1.663
Social	.759	.157	23.41	1	.00	2.136	1.57 2.904
Family	1.117	.229	23.70	1	.00	3.056	1.94 4.791
Residence	.029	1.15	.001	1	.98	1.029	.107 9.915
Interperso	.012	.146	.007	1	.93	1.012	.760 1.349
Surfing	.008	.281	.001	1	.97	1.008	.580 1.749
means							
Constant	-33.634	6.92	23.59	1	.00	.000	

a. Variable(s) entered on step 1: Personal, Social, Family, Residence, interpersonal, surfing means

Table 3: Variables in the Equation

Table 3 shows the variables in the equation, the column of Exp(B) gives the value of odd ratios.

This gives an indication of the change in the predicted odds of addicted or not addicted for each change in the predictor variable. Values less than 1 indicate that an increase in the predictor variable is associated with a decrease in the odds of the event. The significant variables in the model are: social relations and family relations. Thus, for every unit increase in social relations, the odds of the students to be addicted to the internet will significantly increase by 2.136 with a 95% CI of (1.571 and 2.904). For family relations, for every unit increase in family relations, odds of the students to be addicted to the internet will significantly increase by 3.056 with a 95% CI of (1.949 and 4.791). Thus, personal relations, interpersonal relationship, means of surfing the internet and place of residence does not significantly predict students' internet addiction.

Discussion

This study conducted a critical examination of the impact of internet addiction on the interpersonal relationships of undergraduate students at Osun State University in Nigeria. The result revealed that most of the respondents (70%) demonstrated a moderate level of internet addiction; followed by 15.5% of the respondents that demonstrated a mild level of internet addiction and 14.5% exhibit a severe level. Observing the results in the light of previous studies, the study's finding aligns with the fact that there is prevalence of internet addiction among undergraduate students in Nigeria. All findings reported students' addiction at every level - mild, moderate and severe; (Kokka et al. (2021), Wang et al. (2023), Ibrahim et al. (2022), Mahama et al. (2024), Ogboghodo et al. (2024)). Specifically, largest percentages of undergraduates were moderately addicted (Omoyemiju & Popoola, 2021). One the factors that may be responsible for this trend may be the rate at which university education has been computer-based in Nigeria. Computer-based learning in form of online/virtual lecture; sourcing materials online; doing assignments and submission of same on line among others. Apart from academic related activities done online, students also find solace in the social media to relax and relate with friends and families. These may have contributed to the level of addiction evidenced in undergraduate students in Nigeria.

Further results revealed that only the sex of the respondents significantly influenced internet addiction of undergraduate students with higher addiction levels among female students compared to male students. This result agrees with Okwaraji et al. (2015); Omoyemiju and Popoola (2021) and Ogboghodo et al. (2024) studies and is also divergent from Ogbomo and Iwighrehweta (2016) and Şan et al. (2024) that found no gender differences in addiction levels. Notably, none of the previous studies explored found higher addiction levels among female students. This study result showed that age, course, level and religion do not significantly influence the internet addiction of undergraduate students. This finding is deviate from the findings of Arya et al. (2018) and Agbaria and Bdier (2021) that reported higher addiction rates among younger students compared to older ones; in the same vein, Ogboghodo et al. (2024) found significant differences in addiction by academic level, with lower-year students showing increased values. The result further conforms with the findings of Agbaria and Bdier (2021) that there are no significant differences in internet addiction based on their religious inclinations.

In contrast, the investigation's results suggest that factors such as personal connections, interpersonal interactions, internet surfing strategies, and home location do not significantly predict the incidence of internet addiction among students. The study's results suggest a direct

link between the extent of internet addiction among undergraduate students and their challenges in forming and maintaining interpersonal relationships. This is consistent with other studies that discovered a greater probability of interpersonal difficulties among teenagers who are vulnerable to internet addiction (Akanbi et al. 2018; Hao et al. 2022; Nwufo et al. 2023) Research indicates that persons who are prone to internet addiction tend to spend more time alone.

Conclusion

Ultimately, the study's results suggest that there is a significant occurrence of internet addiction among undergraduate students at Osun State University. The addiction level of students is mostly influenced by their moderate behavior, age, degree of study, and religion, while gender does not seem to have a substantial effect. Moreover, research has shown that factors such as personal connections, interpersonal interactions, internet use patterns, and area of residence do not have a substantial influence on the degree of internet addiction among students.

Recommendations based on the findings of the study

Hence, it is recommended that seminars and workshops should be organized to enhance the consciousness of internet addiction among undergraduate students in Osun State.

References

- Abi-Jaoude, E., Naylor, K. T., & Pignatiello, A. (2020). Smartphones, social media use and youth mental health. *CMAJ*, 192(6), E136-E141.
- Adorjan, K., Langgartner, S., Maywald, M., Karch, S., & Pogarell, O. (2021). A cross-sectional survey of internet use among university students. *European Archives of Psychiatry and Clinical Neuroscience*, 271, 975-986.
- Agbaria, Q., & Bdier, D. (2021). Internet addiction among Israeli-Palestinian college students in Israel: its prevalence and relationship to selected demographic variables. *Journal of Concurrent Disorders*, 3(2), 32.
- Akanbi, M. L., Sulaiman, K. A., & Adeyemi, O. I. (2018). Psychosocial consequences of intensive internet use among undergraduates of universities in Ilorin Metropolis". *Library Philosophy and Practice*, 1761 <https://digitalcommons.unl.edu/libphilprac/176>.
- Akin, M. (2017). A research on the impacts of the young people's internet addiction levels and their social media preferences, *International Review of Management and Marketing*, 7(2), 256-262. Retrieved from <http://www.econjournals.com>

- Amano, A., Ahmed, G., Nigussie, K., Asfaw, H., Fekadu, G., Hiko, A., & Soboka, M. (2023). Internet addiction and associated factors among undergraduate students of Jimma University; Jimma, South West Ethiopia, institutional based cross-sectional study. *BMC Psychiatry*, 23(1), 721.
- Aririguzoh, S.A., Sobowale, I., Usaini, S., & Amoka, E. (2018). Influence of the internet on interpersonal communication among youths in Nigeria, 2018.
- Arya, V., Singh, H., & Malhotra, A. K. (2018). Prevalence of Internet addiction and its association with sociodemographic factors among MBBS students at medical college, Jhansi, Uttar Pradesh. *International Journal of Community Medicine and Public Health*, 5(5), 1980-1983. <http://dx.doi.org/10.18203/2394-6040.ijcmph20181709>
- Ballarotto, G., Volpi, B., Marzilli, M., & Tambelli, R. (2018). Adolescent internet abuse: a study on the role of attachment to parents and peers in a large community sample. *Hindawi BioMed Research International*, Article ID 5769250, Retrieved from <https://doi.org/10.1155/2018/5769250>
- Chemnad, K., Alshakhsi, S., Al-Harabsheh, S., Abdelmoneium, A. O., Al-Khalaf, M. S., Baghdady, A., & Ali, R. (2023). Is it contagious? Does parents' internet addiction impact their adolescents' internet addiction? *Social Science Computer Review*, 41(5), 1691-1711.
- Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, 3, 275-285.
- Hao, Q. H., Peng, W., Wang, J., Tu, Y., Li, H., & Zhu, T. M. (2022). The correlation between internet addiction and interpersonal relationship among teenagers and college students based on Pearson's correlation coefficient: a systematic review and meta-analysis. *Frontiers in Psychiatry*, 13, 818494.
- Heilig, M., MacKillop, J., Martinez, D., Rehm, J., Leggio, L., & Vanderschuren, L. J. (2021). Addiction as a brain disease revised: why it still matters, and the need for consilience. *Neuropsychopharmacology*, 46(10), 1715-1723.
- Hou, Y., Xiong, D., Jiang, T., Song, L., & Wang, Q. (2019). Social media addiction: Its impact, mediation, and intervention. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, 13(1), article 4. <http://dx.doi.org/10.5817/CP2019-1-4>.
- Internet world statistics (2019)
- Ibrahim, A. K., Fouad, I., Kelly, S. J., El Fawal, B., & Ahmed, G. K. (2022). Prevalence and determinants of internet addiction among

- medical students and its association with depression. *Journal of Affective Disorders*, 314, 94-102.
- Internet Live Stats (2016). (www.InternetLiveStats.com). Elaboration of data by International Telecommunication Union (ITU), World Bank, and United Nations Population Division.
- Jhangiani, R., & Tarry, H. (2022). 7.2 Close Relationships: Liking and Loving over the Long Term. *Principles of Social Psychology-1st International H5P Edition*.
- Joorabchi, T. N., Afshariyan, M. S., & Armat, R. (2022). Internet addiction mediates the relationships among internet skill and gratification of using internet with social isolation among Malaysian youths: The moderating roles of gender and race. *International Journal of Education and Development using Information and Communication Technology*, 18(2), 111-126.
- Kokka, I., Mourikis, I., Nicolaidis, N. C., Darviri, C., Chrousos, G. P., Kanaka-Gantenbein, C., & Bacopoulou, F. (2021). Exploring the effects of problematic internet use on adolescent sleep: a systematic review. *International Journal of Environmental Research and Public Health*, 18(2), 760.
- Kuss, D. J., & Pontes, H. M. (2018). *Internet addiction*. Hogrefe Publishing GmbH.
- Li, C., Ning, G., Xia, Y., Guo, K., & Liu, Q. (2022). Does the internet bring people closer together or further apart? The impact of internet usage on interpersonal communications. *Behavioral Sciences*, 12(11), 425.
- Liu, L., Zhang, T., & Han, L. (2023). Positive self-disclosure on social network sites and adolescents' friendship quality: The mediating role of positive feedback and the moderating role of social anxiety. *International Journal of Environmental Research and Public Health*, 20(4), 3444.
- Mahama, I., Edoh-Torgah, N. A., Miezah, D., Ammah, C., & Amponsah, M. O. (2024). The predictive relationship between curiosity and internet addiction among tertiary students in Ghana. *Discover Psychology*, 4(1), 114.
- Mengin, A., Allé, M. C., Rolling, J., Ligier, F., Schroder, C., Lalanne, L., ... & Giersch, A. (2020). Conséquences psychopathologiques du confinement. *L'encephale*, 46(3), S43-S52.
- Mohamed, K. O., Soumit, S. M., Elseed, A. A., Allam, W. A., Soomit, A. M., & Humeda, H. S. (2024). Prevalence of internet addiction and its associated risk factors among medical students in Sudan: A cross-sectional study. *Cureus*, 16(2).
- Nadsombat, M. M., & Tomičić, I. (2023). Deep dive into the media world of youth. *EU and comparative law issues and challenges series (ECLIC)*, 7, 363-373.

- Neverkovich, S. D., Bubnova, I. S., Kosarenko, N. N., Sakhieva, R. G., Sizova, Z. M., Zakharova, V. L., & Sergeeva, M. G. (2018). Students' internet addiction: study and prevention. *EURASIA Journal of Mathematics, Science and Technology Education*, 14(4), 1483-1495. DOI: 10.29333/ejmste/83723.
- Nwufo, J. I., Nnadozie, E. E., & Beluonwu, M. I. (2023). Influence of dark triad and family functioning on internet addiction among in-school adolescents in Nsukka urban of Enugu State, Nigeria. *African Journal for the Psychological Studies of Social Issues*, 26(2).
- Ofole, N. M. & Babatunde, O.O. (2015). Internet addiction among undergraduates in university of Ibadan: imperative for counselling intervention. *African Journal for the Psychological Study of Social Issues*, 18(3).
- Ogboghodo, E., Omoregie, E. K., Omoike, E., & Omuemu, V. (2024). Internet addiction among undergraduate students in Southern Nigeria: Implications for policy and practice. *Journal of Medicine and Biomedical Research*, 23(1), 26-35.
- Ogbomo, M. O., & Iwighrehweta, O. (2016). Internet addiction among undergraduates in universities in Delta State, Nigeria. *Inter. J. Acad. Lib. Info. Sci.*, 4(4), 110-116.
- Okwaraji, Aguwa, Onyebueke & Shiweobi, (2015). Assessment of internet addiction and depression in a sample of Nigerian university undergraduates. *International Neuropsychiatric Disease Journal*. 4(3). DOI: 10.9734/INDJ/2015/19096
- Omoyemiju, M. A., & Popoola, B. I. (2021). Prevalence of internet addiction among university students in Nigeria. *British Journal of Guidance & Counselling*, 49(1), 132-139.
- Pimentel, E., Sivalingam, K., Doke, M., & Samikkannu, T. (2020). Effects of drugs of abuse on the blood-brain barrier: a brief overview. *Frontiers in Neuroscience*, 14, 513.
- Rosenthal, R. J., & Faris, S. B. (2019). The etymology and early history of 'addiction'. *Addiction Research & Theory*, 27(5), 437-449.
- Şan, İ., Karsak, H. G. O., İzci, E., & Öncül, K. (2024). Internet addiction of university students in the Covid-19 process. *Heliyon*, 10(8).
- Sanchez-Fernandez, M., Borda-Mas, M., & Mora-Merchan, J. (2023). Problematic internet use by university students and associated predictive factors: A systematic review. *Computers in Human Behavior*, 139, 107532.
- Smith, A., & Anderson, M. (2018). Social media use in 2018. Retrieved from <http://www.pewinternet.org/2018/03/01/social-media-use-in-2018/>
- Stone, C. B., & Wang, Q. (2018). From conversations to digital communication: The mnemonic consequences of consuming and

- sharing information via social media. *Topics in Cognitive Science*, 1-20.
- Tejumaiye, J. A., Simon, G. I., & Obia, V. A. (2018). Uses and gratifications of the internet among university of Lagos undergraduates.
- Turner, S., Fulop, A., & Woodcock, K. A. (2024). Loneliness: Adolescents' perspectives on what causes it, and ways youth services can prevent it. *Children and Youth Services Review*, 157, 107442.
- Ubogu, J., & Chukwusa, J. (2022). Frequency of internet usage in the library by undergraduate students of library and information science (LIS). *Library Progress (International)*, 42(1), 144-152.
- Wang, J. C., Hsieh, C. Y., & Kung, S. H. (2023). The impact of smartphone use on learning effectiveness: A case study of primary school students. *Education and Information Technologies*, 28(6), 6287-6320.
- Wheless, I. R. (1976). Self-disclosure and interpersonal solidarity: Measurement, validation, and relationships. *Human Communication Research*, 3,47-61.
- Xin, M., Xing, J., Pengfei, W., Houru, L., Mengcheng, W., & Hong, Z. (2018). Online activities, prevalence of Internet addiction and risk factors related to family and school among adolescents in China. *Addictive Behaviors Reports*, 7, 14-18. <https://doi.org/10.1016/j.abrep.2017.10.003>
- Young, K. S. (1998b). Internet addiction: the mernge of a new clinical disorder. *CyberPsychology & Behaviour*, 1,237-244.
- Yu, L., & Shek, D. T. L. (2018). Testing longitudinal relationships between Internet addiction and well-being in Hong Kong adolescents: cross-lagged analyses based on three waves of data. *Child Indicators Research*, 11, 1545-1562.