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Smartphone Addiction Among Undergraduates in Lagos State, Nigeria

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Abstract

Smartphone use has significant implications for the mental health of youth, particularly undergraduates who perceive it as an integral part of their identity and social lives. Although previous studies have examined the effects of smartphones globally, limited attention has been given to undergraduates in Lagos State. This study investigates the level of addiction to smartphones and as a mental health indicator among undergraduates in Lagos State, Nigeria. Anchored on the Problematic Internet Use Model, the study employed a survey research method. The population comprised undergraduates from public and private universities in Lagos State, Nigeria. Multistage sampling procedure was adopted: first, universities in Lagos State were stratified into public and private; second, simple random technique enhanced the selection of three each of public and private universities out of a total of four public and five private universities; third, disproportionate sampling approach guided the allotment of 105 respondents each to the six selected universities where a total of 630 undergraduates aged 20–40 participated; and forth, convenience sampling was employed to enumerate the specific respondents. The study employed a self-developed Smartphone Addiction Questionnaire (SAQ), which contains demographics and 12 closed-ended items to elicit data from the undergraduates. The questionnaire was validated by reviews from two scholars, each from the fields of Communication and Media Studies and Test and Measurement, who reviewed the instrument on face value. Subsequently,

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a reliability test was conducted among 60 undergraduates who were subsets of the population but not part of the sampled universities for the main study. The findings were analysed using Cronbach's alpha coefficient, which yielded 0.84, indicating acceptable reliability for the study. The survey was carried out online using Google Forms over a period of four months, from June to October 2025, when the undergraduates were on holiday. Ethically, the study was carried out among adults whose consent was sought and secured before the study was conducted. There was also strict adherence to anonymity and confidentiality clauses. Descriptive statistics were applied. Results revealed that 76.8% of respondents were female, and 58.4% spent more than six hours daily on their smartphones. There is a moderate level of smartphone addiction among undergraduates in Lagos State, Nigeria (M = 2.940, SD = 1.120), manifesting in a habitual and compulsive usage pattern without widespread severe impairment. There is a need for preventive interventions on compulsive smartphone checking and anxiety-related dependence to avoid undergraduates skidding into severe addictions.

Keywords: Mental health, addictive behaviours, anxiety, depression, sleep deprivation, miniaturisation of technology

Introduction

From the medieval period onwards, human communication systems have been repeatedly transformed by media innovations such as the printing press, radio, television, the internet, and digital media. In the 21st century, smartphones have emerged as one of the most influential technologies, reshaping social interaction, information access, and everyday life. Current estimates suggest that more than 7.4 billion smartphones are in circulation globally, with the majority of users aged between 18 and 49 years (Kumar, 2025). Smartphones are cellular telephones integrated with computer systems and features not originally associated with telephony, such as operating systems, web browsing, and the ability to run software applications (Kirvan, 2023). They serve as multifunctional devices, enabling communication, entertainment, navigation, and productivity tasks (Harmon, 2024).

The evolution of smartphones stems from the miniaturisation of technology, which began in 1973 with the reduction of complex components into nano-units. This advancement facilitated the integration of multiple systems into a multiple device, enhancing functionality and performance (Gabel, 2025). The IBM Simon Personal Communicator, built in 1992 and released in 1994, is considered the first smartphone. It combined the features of a cell phone with a personal digital assistant (PDA), offering touchscreen capability, an address book, calendar, calculator, clock, and scheduler (Harmon, 2024). The integration of PDA functions into smartphones marked

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a significant milestone. Subsequent innovations, such as the Ericsson R380 (2000), Blackberry devices, Apple's iPhone (2007), and Google's Android operating system (2007), accelerated the global adoption of smartphones and consolidated their role as indispensable tools in modern society.

Recent statistics highlight the ubiquity of smartphones worldwide. A 2025 Geopoll report estimated 6.9 billion smartphone users, with 5.1 billion actively engaging on social media platforms, representing 62% of the global population. In Africa, approximately 992 million people own smartphones, and internet penetration increased from 5.6% in 2006 to 25.7% in 2016 (Ogunmodede et al., 2023). In Nigeria alone, 98.2 million individuals have access to smartphones (Premise, 2022). These figures underscore the centrality of smartphones in shaping communication and social behaviour across diverse contexts.

While smartphones have transformed social systems and enhanced connectivity, excessive use has been consistently linked to adverse psychological and social outcomes. Ogunmodede et al. (2023) reported heightened psychological distress among undergraduates at the University of Ilorin, while Wellington et al. (2024) identified emotional and social disturbances associated with problematic smartphone use in Ogun State. Balogun et al. (2025) further argued that excessive smartphone use exacerbates addictive tendencies and predicts suicidal behaviours among undergraduates at the University of Ibadan. Across Africa, a multi-country study spanning Nigeria, Tanzania, Ghana, and South Africa revealed significant associations between problematic smartphone use and depression, withdrawal, overuse, and social disturbances (Nkwo et al., 2025). Internationally, similar findings have been reported: in Canada, high smartphone use nearly doubled the risk of anxiety and tripled the risk of suicidal ideation (Kayla, Nour, & Tarun, 2022), while studies in Saudi Arabia and Korea linked excessive use to depressive symptoms and mental distress (Kim et al., 2020).

Despite these insights, limited attention has been directed towards undergraduates in Lagos State, Nigeria, a state characterised by high urban density, diverse student populations, and pervasive digital engagement. This study therefore, investigates the prevalence of smartphone addiction among undergraduates in Lagos State, with the aim of identifying the dominant traits and their implications for mental health.

Research Question

What is the level of smartphone addiction among undergraduates in Lagos State, Nigeria?

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Mental Health and Smartphone

Mental health literacy in many developing countries, including Nigeria, remains limited. Public discourse often emphasizes severe psychiatric conditions such as schizophrenia, which are frequently associated with violent tendencies, stigma, and social unacceptability. Schizophrenia is characterised by distortions in thought processes and perception, with adverse effects across multiple domains of functioning. Its prognosis depends largely on early detection and intervention (Jorm, Korten, Jacomb, Christensen, Rodgers, & Pollitt, 1997). In Nigeria, cultural and religious beliefs strongly influence perceptions of mental illness. For instance, a study in south-western Nigeria found that 48.9% of respondents attributed mental health disorders to supernatural causes, compared to 30.4% and 43.9% who endorsed biological and psychosocial explanations, respectively (Igberase & Okogbenin, 2017). In some contexts, mental illness is perceived as a moral failing rather than a health condition. This perception is reinforced by legal frameworks such as the Nigerian Constitution, which criminalises suicide rather than treating it as a mental health emergency. Such laws perpetuate stereotypes that individuals with mental illness are inherently dangerous, while less visible issues such as addiction, sleep deprivation, anxiety, and agitation receive comparatively little attention.

Addiction is defined as a compulsive craving or mental urge to engage in an activity, often to the point of indispensability. It manifests when individuals struggle to regulate their behaviour and devote excessive time to the activity. Sussman (2011) identifies five defining elements of addiction: engagement in a behaviour to achieve appetitive effects, preoccupation with the behaviour, temporary satiation, loss of control, and negative consequences. Addiction develops gradually, beginning with actions motivated by gratification. Mobile phone addiction has been classified as a behavioural addiction alongside pathological gambling, food addiction, and internet addiction (Moattari, Moattari, Kaka, Kouchesfahani, Sadraie, & Naghdi, 2017). Lin, Chiang, Lin, Chang, and Ko (2016) describe smartphone addiction as obsessive use, repetitive checking for updates, withdrawal symptoms, and agitation when deprived of the device. These behavioural patterns parallel those observed in internet addiction (Block, 2008). While light users may satisfy communication, entertainment, and productivity needs without adverse consequences, problematic use emerges when deprivation leads to uneasiness, loneliness, restlessness, or emptiness (Jacobs, 1986).

Sleep is fundamental to physical, mental, social, and cognitive well-being. Adults typically require seven to eight hours of sleep per night, and deprivation below this threshold constitutes a health risk (Colten, Attevogt, & Institute of Medicine, 2007). Symptoms of sleep deprivation include excessive daytime sleepiness, impaired memory, poor concentration, and depressed

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mood. Research has consistently linked excessive smartphone use to poor sleep quality, particularly when devices are used late at night. The bright light emitted from screens and microwave emissions in bedrooms disrupt circadian rhythms and melatonin production, thereby impairing sleep (Cain & Gradisar, 2010; Kumar, Chandrasekaran, & Brahadeeswari, 2019; Sohn, Krasnoff, Rees, Kalk, & Carter, 2021; Huber et al., 2002).

Anxiety, defined as a cognitive-affective structure within the human defensive system, differs from fear in that it anticipates potential future threats rather than responding to immediate danger (Barlow, 1988, 2000, 2002). It is often experienced as helplessness (Shannon, Bennett, Goldstein, & Barlow, 2009). Anxiety can be triggered by internal or external stimuli, sometimes without conscious awareness (Lovibond & Shanks, 2002). Smartphone overuse has been identified as a potential trigger of anxiety. Hwang, Yoo, and Cho (2012) found that individuals in the smartphone overuse group reported higher levels of anxiety and depression compared to normal users. Similarly, Boumosleh and Jaalouk (2017) demonstrated a positive correlation between smartphone addiction, anxiety, and depression.

In summary, excessive smartphone use is associated with three critical dimensions of mental health: addiction, sleep deprivation, and anxiety. These components interact to undermine psychological well-being, highlighting the need for greater awareness and intervention in contexts such as Nigeria, where mental health literacy remains limited and stigma persists.

Theoretical Framework

Problematic Internet Use Model

The Problematic Internet Use (PIU) model was originally propounded by Robert Davis in 2001. The model involves cognitive processes as well as dysfunctional behaviours, which result in negative consequences for individuals' lives. It shifted the focus from viewing excessive internet use as a primary addiction to understanding it as a behaviour stemming from pre-existing psychological issues such as depression, anxiety, or low self-esteem. These conditions push individuals to prefer online interactions, which are often perceived as offering greater control over self-presentation and less risk of negative evaluation compared to face-to-face interactions.

The model asserts that individuals with a preference for online social interaction are more likely to use the internet to regulate their mood (Caplan, 2005; Caplan, 2007; Caplan, 2010). They tend to exhibit deficient self-regulation in terms of internet use (Kim & Davis, 2009). According to Davis (2001), this behaviour, over time, leads to excessive use, which worsens individuals' problems in a negative cycle (Caplan, 2002; Caplan, 2005; Caplan, 2010). The PIU model therefore represents a distinct pattern of

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internet-related cognitions and behaviours that result in negative life outcomes.

The model highlights key concepts such as psychosocial predispositions, preference for online social interaction, compulsive use cycles, and negative feedback loops. It is divided into specific PIU and generalised PIU. Specific PIU involves overuse of particular internet functions (e.g., gambling), while generalised PIU refers to multidimensional overuse of the internet itself, resulting in negative consequences for individuals' lives (Davis, 2001). Caplan (2002) expanded the model by constructing the Generalised Problematic Internet Use Scale (GPIUS) to assess generalised PIU, and later improved this measure with the Generalised Problematic Internet Use Scale 2, proposing a two-step approach to theory and measurement (Caplan, 2010).

LaRose, Lin, and Eastin (2003), cited in Assunção and Matos (2017), argued that "individuals who use the internet for mood regulation purposes tend to present deficient self-regulation." The model points to an indirect effect between variables, underscoring the relationship between Preference for Online Social Interaction (POSI) and Deficient Self-Regulation (DSR), mediated by Mood Regulation (MR). Studies have found evidence connecting PIU with many psychological and well-being variables. Other research has also linked PIU to loneliness (Ceyhan & Ceyhan, 2008; Kim & Davis, 2009), low self-esteem (Armstrong, Philips & Saling, 2000; Kim & Davis, 2009), and social anxiety (Lee & Stapinski, 2012), highlighting the utility and validity of the PIU model.

In this study, the PIU model, with all its proposed behavioural tendencies, is applied to dysfunctional smartphone use among purposively selected undergraduates in Lagos State, Nigeria. The aim is to understand whether the propositions of the model are consistent with their everyday smartphone use and how this leads to addiction and other mental health issues, such as anxiety and sleep deprivation.

Methodology

This study adopted a survey research design to investigate smartphone addiction among undergraduates in Lagos State, Nigeria. The target population comprised undergraduate students enrolled in universities within the state. A multistage sampling procedure was employed to ensure representativeness across socioeconomic strata.

In the first stage, universities were stratified into public and private institutions. This stratification was necessary to capture the diversity of student experiences across socioeconomic backgrounds. In the second stage, three universities were randomly selected from each stratum, using a simple random sampling technique. Out of four public and five private universities in

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Lagos State, six institutions were ultimately chosen. The use of simple random sampling ensured that all universities had an equal probability of selection.
In the third stage, disproportionate sampling was applied to assign 105 respondents to each of the six selected universities, yielding a total sample size of 630 undergraduates aged between 20 and 40 years. Disproportionate sampling was adopted to guarantee equal representation across institutions, despite differences in student population sizes. In the fourth stage, convenience sampling was used to enumerate respondents within each university, primarily for accessibility and expediency.

Data were collected using a self-developed Smartphone Addiction Questionnaire (SAQ)**,** which comprised demographic items and 12 closed-ended questions designed to elicit quantitative data on smartphone use and addiction-related behaviours. The instrument underwent face validation by two scholars, each from the fields of Communication and Media Studies and Test and Measurement. Reliability testing was subsequently conducted with 60 undergraduates drawn from universities outside the main sample. Cronbach's alpha coefficient yielded a value of 0.84, indicating acceptable internal consistency.

The survey was administered online via Google Forms over a four-month period (June–October 2025), coinciding with the undergraduate holiday break. Ethical considerations were strictly observed: informed consent was obtained from all participants, anonymity was maintained, and confidentiality was assured throughout the study. Data analysis was conducted using descriptive statistics to summarise the findings.

Results, Interpretation and Discussion of Findings

Demographic characteristics and responses to the research questions were analysed using frequency counts and percentages. In all, data were analysed based on two headings: demographic of the participants and responses to research questions.

Demographics of the participants

Table 1: Demographic Characteristics of Participants

Variables	Frequency	Percentage
Gender:		
Female	484	76.8
Male	137	21.7
Prefer not to say	9	1.4
Total	630	100.0
Age		
Below 20 years	204	32.4
20 - 29 years	420	66.7
30-39 years	2	0.3
40 years and above	4	0.6

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Total	630	100.0
Possessing a smart phone		
No	5	.8
Yes	625	99.2
Total	630	100.0
Hours spent on smart phone		
1-2 hours	34	5.4
2-4 hours	72	11.4
4-6 hours	148	23.5
Less than 1 hour	8	1.3
More than 6 hours	368	58.4
Total	630	100.0

Source: Own Research, October, 2025

From Table 1, 76.8% of the surveyed population were female, 21.7% male, and 1.4% preferred not to disclose their sex. This indicates that female undergraduate students constituted the majority of participants in this study. With respect to age group, 32.4% of the undergraduates were below 20 years of age, 66.7% were within the 20–29 age group, 0.5% were within the 30–39 age group, while 0.6% were above 39 years of age. Hence, most of the undergraduates who participated in this research were between 20 and 29 years of age.

Regarding smartphone possession, 99.2% of the undergraduate students who participated in the study possessed a smartphone, while 0.8% did not possess a smartphone. This indicates that the majority of the undergraduate students who participated in this research possessed a smartphone.

As regards hours spent on phones, 1.3% of the respondents spent less than one hour, 5.4% spent 1–2 hours, 11.4% spent 2–4 hours, 23.5% spent 4–6 hours, while 58.4% spent more than six hours. Hence, most of the undergraduates who participated in this research spent more than six hours on their smartphones daily.

Level of Smartphone Addiction Among Undergraduates in Lagos State, Nigeria

Table 2: Smartphone Use and Addiction

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Mean	Std. Dev.
I feel restless when I cannot use my smartphone	53	122	179	191	85	3.211	1.154
	8.4%	19.4%	28.4%	30.3%	13.5%		
I find it hard to concentrate on my schoolwork because I keep getting distracted by my smartphone	87	212	159	142	30	2.708	1.105
	13.8%	33.7%	25.2%	22.5%	4.8%		
	24	63	115	323	105	3.670	.992

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I use my smartphone longer than I intend to.	3.8%	10.0%	18.3%	51.3%	16.7%		
I feel uneasy if I haven't checked my smartphone for a while.	24	128	142	249	87	3.392	1.073
	3.8%	20.3%	22.5%	39.5%	13.8%		
I prefer spending time on my smartphone rather than with classmates, family, or friends in person.	68	188	145	152	77	2.971	1.209
	10.8%	29.8%	23.0%	24.1%	12.2%		
I check my smartphone as soon as I wake up or before going to bed.	16	64	101	325	124	3.757	.967
	2.5%	10.2%	16.0%	51.6%	19.7%		
I feel anxious when my smartphone battery is low or I have no data.	35	58	97	270	170	3.765	1.113
	5.6%	9.2%	15.4%	42.9%	27.0%		
I sometimes miss planned activities beecause of my smartphone use.	111	262	91	114	52	2.578	1.207
	17.6%	41.6%	14.4%	18.1%	8.3%		
I have trouble sleeping because I use my smartphone late at night.	201	149	189	69	22	2.305	1.132
	31.9%	23.7%	30.0%	11.0%	3.5%		
I feel stressed or anxious when I cannot use my smartphone.	129	148	235	77	41	2.608	1.134
	20.5%	23.5%	37.3%	12.2%	6.5%		
I feel left out or lonely when I see others' posts on social media.	312	137	122	36	23	1.922	1.114
	49.5%	21.7%	19.4%	5.7%	3.7%		
I found myself feeling agitated when my posts are not liked or attract no reactions.	202	134	185	60	49	2.397	1.241
	32.1%	21.3%	29.4%	9.5%	7.8%		
Grand Mean						2.940	1.120

Source: Own Research, October, 2025

The findings indicate various levels of smartphone addiction by undergraduates in Lagos State, Nigeria. With respect to how they feel when they cannot use their smartphones, a total of 43.8% agreed that they feel restless (M = 3.211, SD = 1.154), indicating moderate psychological dependence, which is a reflection of early withdrawal-like symptoms consistent with behavioural addiction frameworks (Elhai, Levine, Dvorak, & Hall, 2017). Such restlessness, according to Billieux et. al. (2015), has been linked to impaired self-regulation in digital device use. It is also aligning with the thesis of the Problematic Internet Use Model in terms of the tendencies to exhibit deficient self-regulation in terms of internet use (Kim & Davis, 2009).

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However, further exploration of the undergraduates' use of smartphones, especially in relation to concentration on schoolwork, reveals that 47.5% of the undergraduates indicates disagree (M = 2.708, SD = 1.105), which connotes that although there is a presence of academic disruption, it is not dominant. Lepp et.al. (2015) and Samaha & Hawi (2016) have shown that moderate distraction has negative effects on academic performance over time. Smartphone use beyond intention indicates an agreement from 68.0% of the undergraduates (M = 3.670, SD = 0.992), which is one of the strongest indicators in the study. It is a reflection of loss of control, a central feature of behavioural addiction models (Griffiths, 2005; Brand et.al., 2019). Succinctly, the data suggests there is prevalent compulsive usage pattern of smartphone by undergraduates in Lagos State.

Similarly, there is a feeling of uneasiness when not checking phone by the respondents, (M = 3.392, SD = 1.073). With 53.3% agreement, it indicates psychological dependence and habitual checking behaviour. The findings align with the studies of Busch & McCarthy (2021), who reported a link between frequent checking of smartphone and addiction severity.

Fair enough, the preference for smartphones in social interaction recorded mixed responses with no strong social substitution effect (M = 2.971, SD = 1.209). The finding is in contrast with severe displacement patterns reported in highly digitised contexts (Kuss & Griffiths, 2017).

On the contrary, immediate checking behaviour after waking up of before going to bed recorded one of the highest rated items (M = 3.757, SD = 0.967). It indicates that 71.3% of the respondents are in agreement, which reflects automatic habitual behaviour. Such automatic habitual behaviour is strongly associated with smartphone addiction (Montag et.al., 2021).

The most salient part of the study is the anxiety over low battery/ data, which shows the highest mean score (M = 3.765, SD = 1.113). It is an indication of nomophobia anxiety. It aligns with the evidence that fear of disconnection is a core feature of problematic smartphone use and that it is prevalent among university students (Elhai et.al.,2019; & Al-Mamun et.al., 2025).

On missing planned activities, the respondents indicate limited disruption on their schedules as a result of smartphone use (M = 2.578, SD = 1.207). A majority of the respondents (59.2%) indicate disagreement. It is a sign of limited functional impairment. In other words, smartphone use has not yet significantly disrupted daily responsibilities. Also, sleep disturbance is relatively low (M = 2.305, SD = 1.132) with 55.6% in disagreement, the data contrast with the findings of Lepp et.al. (2015) that link nighttime smartphone use to poor sleep quality in more severe addiction cases.

There are mixed responses on stress and anxiety from inability to use smartphone with data indicating moderate emotional dependence (M = 2.608,

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SD = 1.134). Consequently, it is not yet a dominant feature of addiction in this population. Also, loneliness from social media comparison ("I feel left out or lonely when I see others' posts on social media") received the lowest mean score (M = 1.922, SD = 1.114) with nearly 71.2% of the undergraduates, indicating disagreement, which interprets that social comparison effects are weak in this context and that smartphone addiction is not primarily driven by social validation needs.

Finally, the emotional reaction to post-engagement is limited (M = 2.397, SD = 1.241). A majority disagreed (53.4%), indicating limited dependency on online approval or reinforcement.

In all, there is a moderate level of smartphone addiction among undergraduates in Lagos State, Nigeria, as indicated by the grand mean (M = 2.940, SD = 1.120), suggesting the presence of habitual and compulsive usage patterns without widespread severe impairment.

Discussion

The study reveals a moderate level of smartphone addiction among undergraduates in Lagos State, Nigeria. This addiction is primarily manifested through habit formation, compulsive checking, and loss of usage control, rather than emotional dependency or social media validation. The strongest behavioural indicators, excessive use beyond intention, immediate checking upon waking and before sleeping, and anxiety over battery or data loss, reflect core addiction components of salience, compulsion, and withdrawal-like anxiety (Griffiths, 2005; Brand et al., 2019). These findings align with the I-PACE model, which conceptualises addictive behaviour as the outcome of interactions between personal traits, affective responses, and deficits in executive control (Brand et al., 2019).

Indicators such as restlessness when unable to use smartphones and uneasiness when not checking devices suggest emerging psychological dependence, consistent with evidence that frequent smartphone use activates reward-based reinforcement systems (Billieux et al., 2015; Montag et al., 2021). However, relatively low scores on academic disruption, sleep disturbance, and missed responsibilities indicate that smartphone use has not yet escalated into severe functional impairment. This supports the view that many users are in a pre-addiction or at-risk stage, rather than experiencing full-blown addiction (Panova & Carbonell, 2018).

Interestingly, social media-related emotional factors, such as feelings of loneliness when viewing others' posts or agitation over low engagement, were weakly endorsed. This suggests that smartphone addiction in this population is not primarily driven by social comparison or online validation needs, diverging from findings in Western contexts where social comparison is a strong predictor of smartphone addiction (Kuss & Griffiths, 2017).

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Instead, the addiction pattern observed among Lagos undergraduates appears to be behaviourally driven, shaped by habitual reinforcement and digital routines rather than psychosocial disruption. This is consistent with recent evidence that smartphone addiction is increasingly characterised by automatic usage loops and digital habit formation rather than emotional dependency alone (Montag et al., 2021; Busch & McCarthy, 2021).

Nevertheless, the high prevalence of compulsive checking and anxiety-related dependence signals a potential risk of progression into more severe addiction if preventive interventions are not implemented. Without targeted awareness campaigns and self-regulation strategies, these behavioural tendencies may evolve into more entrenched patterns of functional impairment, including academic decline, sleep disruption, and heightened psychological distress.

Conclusion and Recommendation

Smartphone addiction is at a moderate level, being primarily driven by habit formation, compulsive checking, and loss of usage control, among undergraduates in Lagos State, Nigeria, with the need for urgent actions to forestall emotional dependency and social media validation. There is also an urgent need for multidisciplinary training and campaigns on the dysfunctional effects of smartphone addiction on productivity, efficiency and the national economy. The training and campaign should emphasise preventive interventions on compulsive smartphone checking and anxiety-related dependence to avoid undergraduates skidding into severe addictions.

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Data Availability: All data are included in the content of the paper.

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Declaration for Human Participants: This study has been approved by the Lagos State University Ethics Committee, and the principles of the Helsinki Declaration were followed.

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