

Digital Triggers of Adolescent Anxiety in Oyo Town, Nigeria

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Article Info

Article history:

Received 2025-06-16

Revised 2025-07-09

Accepted 2025-08-01

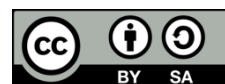
Keywords:

Anxiety
Cyberbullying
Mental health
Peer support
Social media

ABSTRACT

Anxiety disorders represent one of the most prevalent mental health challenges among adolescents globally, with significant implications for academic performance, social development, and overall well-being. While extensive research has examined the impact of digital technology on mental health in Western contexts, there remains a critical gap in understanding these relationships in smaller urban centres in Africa. This study addressed this gap by investigating the relationships between social media use intensity, cyberbullying victimisation, online peer support, and anxiety levels among adolescents in Oyo Town, Nigeria. A cross-sectional correlational design was employed with 250 adolescents (mean age=15.2years, SD=1.8;52% female) selected through multistage sampling from four secondary schools across two Local Government Areas. Data were collected using validated instruments: the SMUIS, CVS, OSS, and the SCARED scales. Pearson correlation analysis revealed significant positive correlations between anxiety levels and both social media use intensity ($r=0.483, p<.005$) and cyberbullying victimisation ($r=0.652, p<.005$), while online peer support demonstrated a significant protective effect ($r=-0.316, p<.001$). Multiple regression analysis identified cyberbullying exposure as the strongest predictor of anxiety levels ($\beta=.526, p<.001$), followed by social media use intensity ($\beta=.312, p<.001$), with online peer support serving as a significant protective factor ($\beta=-.241, p<.001$). These digital variables accounted for 64.3% of the variance in adolescent anxiety levels, indicating a substantial influence of digital experiences on youth mental health in this context. The findings underscore the critical need for comprehensive cyberbullying prevention programs and culturally appropriate digital literacy interventions in Nigerian educational settings, while highlighting the potential of online peer support networks as protective mechanisms against adolescent anxiety.

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1. INTRODUCTION

Anxiety among adolescents has become a serious public health issue in the world with long-term consequences on academic performance, social functioning, and psychological well-being. Epidemiological data have shown that between 10 and 20 per cent of adolescents all over the world have clinically significant symptoms of anxiety, and thus, it is one of the most common mental health conditions in the adolescent population [1]. The condition is even worse in developing countries, where the rates are usually higher than the world averages because of sociocultural pressures and inadequate mental health care systems. In Nigeria, specifically, Adewuya et al. [2] note that 15-25 per cent of adolescents develop anxiety symptoms so severe that they interfere with their daily functioning, which indicates a mental health crisis in the country that is particularly impactful on the youth population. Such numbers are not just abstract numbers; they embody the struggles of millions of teenagers who live in a rapidly changing world and often find themselves without support.

This is the mental health burden that is complicated by the fact that the digital revolution has added new and complex layers to adolescent anxiety. The current generation of adolescents, commonly referred to as digital natives, is living in a constantly connected world that has transformed the way they interact with each other, develop identity, and relate to the world [3]. Although digital technologies provide the greatest opportunities to learn and connect, they put young users at psychological risk. In longitudinal studies, the prevalence of anxiety diagnoses in adolescents has grown by 58 per cent in the last ten years, which is in close connection with the explosive growth in digital media consumption [4]. The digitalisation of youth culture has been particularly fast in Nigeria, which happens alongside insufficient adult control, poor regulatory systems, and a lack of digital literacy education [5]. Although there is growing international research on digital mental health, little is known about these connections in smaller Nigerian towns, such as Oyo, where digital integration is fast but under-regulated.

Social media use intensity is one of the most prominent factors of digital-age anxiety. The current generation of teenagers spends a large part of their day on Instagram, TikTok, and WhatsApp. A dose-dependent relationship was found between time spent on social media and anxiety severity, with users exceeding five hours per day exhibiting the highest risk [6]. The mechanisms involved in this relationship are the amplified exposure to idealised social comparisons, fear of missing out (FoMO), altered sleeping patterns, and decreased face-to-face interaction, which are shown to worsen emotional vulnerability [7]. Disturbingly, Nigerian adolescents spend an average of 5.2 hours a day on social media, which is not always supervised or monitored, indicating a greater vulnerability to its negative influence [8].

Digital media use and adolescent anxiety in Nigeria must be examined in the context of the local culture, especially its norms that focus on collectivism, reputation, and social conformity. The digital engagement of Nigerian adolescents, particularly those in smaller cities, such as Oyo Town, is affected by a special combination of digital activities and sociocultural norms, including family honour and the avoidance of public humiliation.

This is unlike individualistic cultures, whereby personal autonomy usually takes precedence. Collective identity and fear of losing social status in the community in Nigeria can increase the emotional intensity of online experience, including cyberbullying. The current literature on the role of identity development and social comparison in adolescents, especially in collectivistic cultures, indicates that online humiliation might have much more severe psychological effects than in individualistic cultures, where the damage to reputation is more limited [29, 30]. Moreover, the high rate of digitalisation in Nigeria, the lack of adult control, and the disunity of mental health services provide an ideal environment that can contribute to the rise of digital anxiety in adolescents. This marks the importance of a culturally sensitive perception of digital behaviour among Nigerian teenagers.

Equally concerning is the rising incidence of cyberbullying, defined as intentional and repeated harm inflicted through digital means. Unlike traditional bullying, cyberbullying operates beyond school hours, reaches broader audiences, and is often perpetrated anonymously, making it more invasive and persistent [9]. A recent study found that adolescents who experienced cyberbullying were 2.5 times more likely to develop clinical anxiety symptoms compared to their non-bullied peers [10]. In Nigeria, this issue is intensified by institutional neglect: it has been revealed that only 23% of secondary schools had formal cyberbullying policies, and fewer than one in five adolescents knew how to respond to online harassment [11]. This institutional gap, combined with cultural stigma around mental health, contributes to a silent epidemic of unaddressed digital trauma among Nigerian youth.

However, the digital world is not uniformly harmful. Emerging research highlights the potential of online peer support as a protective factor. Online peer support refers to adolescents' emotional, informational, and social connections through digital platforms, particularly when offline support is limited. For marginalised youth or those navigating psychosocial distress, these digital communities can offer crucial validation, empathy, and a sense of belonging [12]. In addition, adolescents who received high-quality online social support reported significantly lower anxiety levels, even in the presence of negative online interactions [13]. This suggests that the digital space holds risks and opportunities for emotional resilience, contingent on the quality and context of online engagements.

In Nigeria, these dynamics are further shaped by a unique sociocultural backdrop. The country's collectivist cultural norms—characterised by strong emphasis on family honour, communal relationships, and moral conformity—may intensify the psychological impact of public shaming or social exclusion, especially in online contexts [14]. Outside major metropolitan hubs, adolescents in towns like Oyo may experience a distinctive intersection of digital engagement and cultural expectations. However, most empirical studies on adolescent digital behaviour in Nigeria have focused on urban centres such as Lagos and Abuja, neglecting smaller but equally important communities. This geographic and cultural underrepresentation creates a critical blind spot in national mental health and education policy.

Further, while there is an increasing international research base examining the overlap between social media use, cyberbullying, peer support, and adolescent mental

health, there are still considerable gaps in knowledge in sub-Saharan settings. In addition, the current research tends to study these variables separately instead of investigating their combined and interactive impact on adolescent anxiety. This restricts theory and practice. The need to fill these gaps is particularly acute in Nigeria, where a young population is rapidly adopting digital technologies at an unprecedented rate, frequently without proper digital or psychological protection.

The current study aims to fill these gaps by investigating the interrelationships between the intensity of social media use, cyberbullying victimisation, online peer support, and the level of anxiety among adolescents in Oyo Town, Nigeria. The study will help to provide a more detailed picture of adolescent digital well-being in various cultural and geographical settings by paying attention to this under-researched area and considering several interconnected variables. The results will be significant to educators, parents, clinicians, and policymakers who want to develop effective and culturally-based interventions that can help Nigerian adolescents explore digital spaces safely and healthily.

2. LITERATURE REVIEW

Prevalence and Nature of Adolescent Anxiety

Adolescent anxiety has become a global public health concern, with studies estimating that between 10% to 20% of adolescents experience clinically significant anxiety symptoms, a figure that may be higher in low- and middle-income countries (LMICs) due to sociocultural stressors and inadequate mental health infrastructure [42]. In Nigeria, a report highlighted that up to 32.1% of adolescents suffer from anxiety severe enough to affect their daily lives, underscoring the importance of addressing this issue in local contexts [54]. Anxiety disorders, when left untreated, can significantly impair academic performance, social relationships, and overall well-being [45].

Impact of Social Media Use on Anxiety

The rise of digital technology has radically transformed the social environments of adolescents. Studies have consistently shown that social media use is linked to higher levels of anxiety. Digital engagement, especially on platforms such as Instagram and TikTok, introduces adolescents to idealised social comparisons, fear of missing out (FoMO), and disrupted sleep patterns, all exacerbating emotional vulnerability [52]. Studies that specifically address the role of social media use in adolescent anxiety have shown that excessive use of social media is usually linked to increased social anxiety [35]. In addition, adolescents who use social media more than five hours a day are especially vulnerable to the development of anxiety symptoms [36].

However, it should be mentioned that the use of social media may also be beneficial, e.g., serving as an outlet of emotional expression and peer support [40]. For example, online communities may provide an opportunity to seek social support among adolescents, especially in regions where offline support is unavailable [35]. Nevertheless, research has expressed concerns regarding the general negative effects of excessive use of digital media, especially when it comes to the setting of Nigerian adolescents, where the uncontrolled use is more common [45].

Cyberbullying and Anxiety

Cyberbullying is one of the most serious digital stressors that leads to anxiety in adolescents. Cyberbullying is a very harmful phenomenon because of its anonymity and ubiquity. Cyberbullying causes an increase in the levels of anxiety in adolescents, and studies show that the adolescents who experience cyberbullying have 2.5 times higher chances of developing clinical anxiety symptoms compared to those who are not bullied [51]. Moreover, it has been argued that the emotional cost of cyberbullying can be even higher in collectivist societies, such as Nigeria, where reputation and social position are of utmost importance due to the cumulative effect of digital aggression [36].

The absence of proper cyberbullying prevention policies in schools, alongside the cultural stigma of mental health in Nigeria, has left many afflicted adolescents without the support they need to deal with these problems. Consequently, this population group is still exposed to long-term consequences of digital victimisation [37].

Protective Role of Online Peer Support

Unlike the adverse consequences of cyberbullying, online peer support has been viewed as a possible protective factor against anxiety. Online sources can offer emotional and social support to adolescents, particularly when they lack offline resources [50]. Adolescents who report high-quality online support show lower anxiety levels [52]. Nevertheless, online support's effects are conditional on factors such as the quality of interactions and the general digital environment. Peer support networks can be weakly effective when not properly moderated or when they encourage bad behaviour [39]. This indicates that proper and safe online environments are required to promote emotional resilience in teenagers [50].

Challenges of Digital Interventions

Although digital interventions have shown promise in alleviating adolescent anxiety, especially in contexts like the COVID-19 pandemic, several challenges remain. A meta-analysis of digital interventions for adolescent anxiety found that these programs, while effective in reducing anxiety symptoms, were influenced by several factors, including the involvement of therapists and the number of sessions [38]. However, many digital interventions lack the personalised, culturally tailored approaches required to address the unique needs of adolescents in non-Western settings such as Nigeria [45].

The Need for Contextual Approaches in Nigerian Adolescents

The relationship between digital media use and adolescent anxiety is not uniform across cultures. In Nigeria, cultural factors such as collectivism, family honour, and the fear of public shame create a distinctive emotional landscape for adolescents engaging with digital platforms [55]. The rapid adoption of digital technologies in Nigeria, coupled with the lack of effective supervision and digital literacy programs, exacerbates the risk of digital anxiety [35]. There is a clear need for culturally appropriate interventions that take into account local values and norms to effectively mitigate the harmful effects of digital media on Nigerian adolescents' mental health [45].

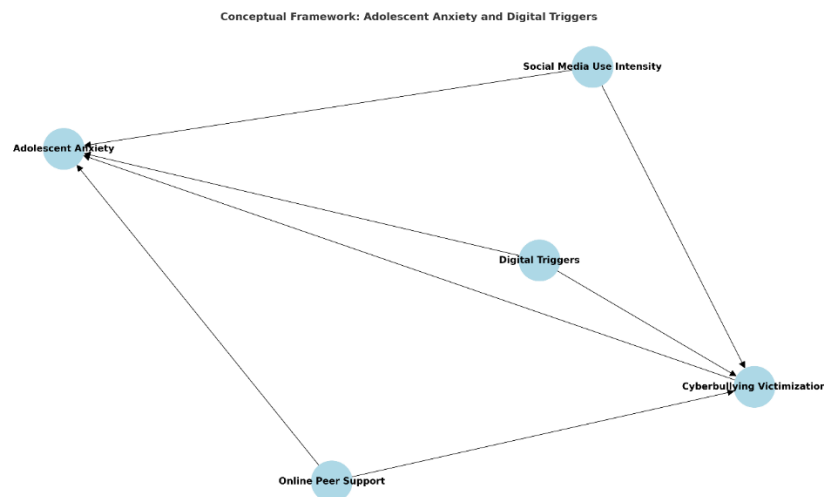


Figure 1: Conceptual framework for the study

Purpose of the Study

The general purpose of this study is to examine the relationships between social media use, cyberbullying exposure, online peer support, and anxiety levels among adolescents in Oyo Town, Nigeria. Specifically, this study seeks to:

- a. Examine the relationships that exist among social media use intensity, cyberbullying victimisation, online peer support, and anxiety levels.
- b. Investigate the joint contribution of the independent variables (social media use intensity, cyberbullying victimisation, and online peer support) to the dependent variable (anxiety levels).
- c. Determine the relative contribution of each independent variable (social media use intensity, cyberbullying victimisation, and online peer support) to the dependent variable (anxiety levels).

Research Questions

- a. What are the relationships that exist among social media use intensity, cyberbullying victimisation, online peer support, and anxiety levels among adolescents in Oyo Town?
- b. What is the joint contribution of the independent variables (social media use intensity, cyberbullying victimisation, and online peer support) to the dependent variable (anxiety levels) among adolescents in Oyo Town?
- c. What is the relative contribution of each independent variable (social media use intensity, cyberbullying victimisation, and online peer support) to the dependent variable (anxiety levels) among adolescents in Oyo Town?

3. METHOD

This study employed a cross-sectional, correlational research design to examine the relationships between social media use intensity, cyberbullying victimisation, online peer support, and anxiety levels among adolescents in Oyo Town, Nigeria. This design was appropriate for investigating the associations between multiple variables at a single point in

time while exploring their predictive relationships. The target population for this study consisted of all secondary school adolescents (ages 13-18) in Oyo Town, Nigeria.

A multistage sampling procedure was utilised to select participants for the study. In the first stage, simple random sampling was used to select two Local Government Areas in Oyo Town. In the second stage, stratified random sampling was employed to select two secondary schools from each LGA, ensuring representation of both public and private institutions. In the third stage, systematic random sampling was used to select participants from each class level (JSS1-SS3), with consideration given to maintaining proportional representation across gender and age groups. Two hundred eighty participants were initially recruited, with 250 providing complete data for the final analysis.

Data was collected using self-administered questionnaires after obtaining necessary permissions from school authorities, informed consent from parents/guardians, and assent from the adolescents themselves. Questionnaires were administered during regular school hours in classroom settings with the assistance of trained research assistants. Participants were instructed not to write their names on the questionnaires to ensure confidentiality and encourage honest responses, and completed forms were collected in sealed envelopes.

Throughout the study, stringent ethical considerations were observed. The research protocol received approval from the Institutional Review Board prior to implementation. Participation was entirely voluntary, and students were informed of their right to withdraw at any point without consequences. All data was treated with strict confidentiality, with questionnaires coded using numerical identifiers to protect participant privacy. Additionally, given the sensitive nature of some questions related to cyberbullying and anxiety, a school counsellor was made available for consultation if any participant experienced distress during or after completing the questionnaire.

Data analysis was conducted using SPSS version 25.0. Descriptive statistics (means, standard deviations, and frequencies) were calculated to summarise participant characteristics and study variables. Pearson's correlation analysis was used to examine the relationships between social media use intensity, cyberbullying victimisation, online peer support, and anxiety levels (Research Question 1). Multiple regression analysis was employed to determine the independent variables' joint contribution (Research Question 2) and relative contributions (Research Question 3) to anxiety levels. Statistical significance was set at $p < .05$ for all analyses. Results are presented in tables showing descriptive statistics, correlation coefficients, and regression coefficients, accompanied by narrative interpretations.

Instruments

Demographic Questionnaire: A researcher-developed demographic questionnaire was used to collect information on participants' age, gender, school type, class level, parents' educational level, and basic patterns of internet and social media access.

Social Media Use Integration Scale (SMUIS)

The SMUIS, developed by Jenkins et al. [15], is a 10-item self-report measure designed to assess the extent to which social media is integrated into individuals' social behaviour and

daily routines and the emotional connection to these platforms. Participants respond to items on a 6-point Likert scale ranging from 1 (Strongly Disagree) to 6 (Strongly Agree). The scale yields two subscale scores (Social Integration and Emotional Connection, and Integration into Social Routines) and a total score, with higher scores indicating greater intensity of social media use and integration into daily life. Sample items include "I feel disconnected from friends when I have not logged into social media" and "I would be disappointed if I could not use social media at all." The SMUIS has demonstrated good psychometric properties across various adolescent populations. For this study, a pilot study was conducted with 40 adolescents from a different school in Oyo Town to ascertain the scale's reliability within the target population. The Cronbach's alpha coefficient for the total scale was 0.87, indicating high internal consistency. The total scale score will be used in the main analysis to represent participants' social media use intensity.

Cyberbullying Victimization Scale (CVS)

The CVS developed by Giumetti and Kowalski [16] is a 15-item measure that assesses experiences of being cyberbullied across various digital platforms. Participants indicate the frequency of cyberbullying experiences over the past six months on a 5-point Likert scale ranging from 0 (Never) to 4 (Several times a week). The scale measures different forms of cyberbullying victimisation, including harassment, denigration, impersonation, and exclusion. Sample items include "Someone posted embarrassing photos or videos of me online without my permission" and "I received threatening or intimidating messages online." Higher scores indicate greater exposure to cyberbullying victimisation. The scale has demonstrated good reliability and validity in previous studies with adolescent populations. In a pilot study, the Cronbach's alpha was 0.89, indicating an excellent internal consistency among the Nigerian adolescent population. The analysis will be performed using the total score as an indicator of the level of cyberbullying victimisation of participants.

Online Social Support Scale (OSSS)

The OSSS scale, created by Nick et al. [17], is a 12-item tool that assesses perceived social support when accessed online and via social media. The scale measures three aspects of online social support: emotional, informational, and social companionship. The items are answered on a 5-point Likert scale, where 1-Strongly Disagree and 5-Strongly Agree. Examples of the items are: When I feel lonely, there are a few people online that I can talk to, and I can find people online who can give me good advice about a crisis in case I need it. The higher the scores, the more perceived online social support there is. The scale has demonstrated adequate reliability and validity in earlier studies among adolescent groups. In the present research, a pilot study conducted in Nigeria among adolescents resulted in a Cronbach's alpha of 0.84 on the total scale, which indicates internal consistency. The level of perceived online social support will be used in the analysis using the total score.

Screen for Child Anxiety Related Disorders (SCARED)

The SCARED, developed by Birmaher et al. [18], is a 41-item self-report measure designed to screen for anxiety disorders in children and adolescents. The scale assesses symptoms across five dimensions: panic disorder, generalised anxiety disorder, separation anxiety, social anxiety, and school avoidance. Participants indicate how frequently they experience each symptom on a 3-point scale: 0 (Not True or Hardly Ever True), 1 (Somewhat True or Sometimes True), and 2 (Very True or Often True). Sample items include "I worry about things working out for me" and "I feel nervous with people I do not know well." A total score is calculated by summing all items, with higher scores indicating greater anxiety symptoms. A score of 25 or higher suggests the possible presence of an anxiety disorder. The SCARED has demonstrated strong psychometric properties across diverse populations and has been validated for use with Nigerian adolescents. A pilot study for this research yielded a Cronbach's alpha of 0.90 for the total scale, indicating excellent internal consistency. This study will use the total anxiety score as the primary outcome measure.

NB: *These instruments were selected based on their robust psychometric properties, including high internal consistency demonstrated in this study's pilot phase. More importantly, they have undergone cross-cultural validation and have been previously used effectively with adolescent populations in sub-Saharan Africa, including Nigeria. Their relevance to the study's constructs—social media use, cyberbullying, online peer support, and anxiety—ensures that the measures are contextually appropriate and theoretically grounded. The adaptation through piloting with local adolescents further enhanced their reliability and cultural fit, making them suitable for assessing psychological and behavioural variables among Nigerian secondary school students.*

4. RESULTS AND DISCUSSION

3.1. Results

Data Analysis

This section presents the results obtained from the quantitative analysis of data. The results are presented question by question, with the aid of fully labelled tables for clear illustration. The explanation of the contents of each table is presented after it. A summary of the study findings is also presented in this section.

Table 1: Participant demographics by age, gender, and school type

Variable	Category	Frequency (n)	Percentage (%)
Age Group	13–14 years	72	28.8%
	15–16 years	108	43.2%
	17–18 years	70	28.0%
Gender	Male	122	48.8%
	Female	128	51.2%
School Type	Public School	136	54.4%
	Private School	114	45.6%

Research Question 1: What are the relationships that exist among social media use intensity, cyberbullying victimisation, online peer support, and anxiety levels among adolescents in Oyo Town?

The result from Table 1 depicts the test of significant correlations among independent variables (social media use intensity, cyberbullying victimisation, and online peer support) and the dependent variable (anxiety levels).

Table 2. Summary of Test of Significant Correlations among Independent Variables and Anxiety Levels

Variables	Mean	SD	Anxiety Levels (r)	Sig. p	Remark
Anxiety Levels	28.35	12.46	1.000		
Social Media Use Intensity	41.32	9.78	0.483	0.000	S
Cyberbullying Victimization	17.64	8.92	0.652	0.000	S
Online Peer Support	35.28	8.47	-0.316	0.000	S

Significant at $P < .05$

As shown in Table 2, the mean anxiety level score among the adolescents was 28.35 (SD = 12.46), which is slightly above the clinical cutoff score of 25 on the SCARED scale, suggesting elevated anxiety symptoms in the study population. The results revealed significant relationships between anxiety levels and all three independent variables. Specifically, there were significant positive correlations between anxiety levels and both social media use intensity ($r = 0.483$, $p < .05$) and cyberbullying victimisation ($r = 0.652$, $p < .05$), indicating that higher levels of these variables were associated with increased anxiety symptoms. The strongest correlation was observed between cyberbullying victimisation and anxiety levels, suggesting that exposure to online harassment may be particularly detrimental to adolescent psychological well-being. Conversely, a significant negative correlation was found between online peer support and anxiety levels ($r = -0.316$, $p < .05$), suggesting that higher perceived support in online environments may serve as a protective factor against anxiety symptoms.

Research Question 2: What is the joint contribution of the independent variables (social media use intensity, cyberbullying victimisation, and online peer support) to the dependent variable (anxiety levels) among adolescents in Oyo Town?

Table 3. Multiple Regression Analysis of the Combined Prediction of Dependent Variable (Anxiety Levels) by the Three Independent Variables (Social Media Use Intensity, Cyberbullying Victimization, and Online Peer Support)

R	R- Square	Adjusted R-squared	Std. Error of the Estimate
0.802	0.643	0.638	7.49232

Table 4. Analysis of Variance

Source of Variation	Sum of Squares	Df	Mean Square	F	Sig
Regression	24804.325	3	8268.108	147.236	.000
Residual	13799.675	249	56.136		
Total	38604.000	249			

Significant at $p < .05$

Table 3 presents the results of the multiple regression analysis examining the joint contribution of all three independent variables to anxiety levels. The coefficient of multiple correlation ($R = 0.802$) indicates a strong relationship between the combined independent variables and the dependent variable. The coefficient of determination ($R^2 = 0.643$) reveals that social media use intensity, cyberbullying victimisation, and online peer support collectively explained 64.3% of the variance in anxiety levels among the adolescents. This substantial proportion suggests that digital experiences play a significant role in adolescent anxiety within this population.

The ANOVA results further confirm the statistical significance of this joint contribution ($F(3, 246) = 147.236, p < .05$). This finding indicates that the regression model significantly predicts anxiety levels and that the combination of these three aspects of digital experience substantially influences adolescent psychological well-being. The remaining 35.7% of unexplained variance suggests that other factors not included in this model, such as individual temperament, family dynamics, academic pressure, and socioeconomic factors, may also contribute to adolescent anxiety levels.

Research Question 3: What is the relative contribution of each independent variable (social media use intensity, cyberbullying victimisation, and online peer support) to the dependent variable (anxiety levels) among adolescents in Oyo Town?

Table 5 displays the relative contributions of each independent variable to anxiety levels as indicated by the standardised beta coefficients. All three independent variables made statistically significant contributions to predicting anxiety levels. Cyberbullying victimisation emerged as the strongest predictor ($\beta = 0.526, p < .05$), indicating that for every one standard deviation increase in cyberbullying victimisation, anxiety levels increased by 0.526 standard deviations when controlling for the other variables. The beta value of 0.526 indicates a large effect size, suggesting that cyberbullying victimisation is a strong predictor of anxiety among adolescents. Social media use intensity was the second strongest predictor ($\beta = 0.312, p < .05$), demonstrating that higher levels of social media engagement were associated with increased anxiety symptoms. This beta value of 0.312

reflects a moderate effect size, indicating a meaningful, though less substantial, impact on anxiety compared to cyberbullying. Online peer support showed a significant negative relationship with anxiety levels ($\beta = -0.241$, $p < .05$), confirming its protective function against anxiety symptoms even when accounting for the negative effects of the other variables. The beta value of -0.241 represents a small to moderate effect size, suggesting that online peer support has a modest yet statistically significant buffering effect on adolescent anxiety.

Table 5. Relative Contribution of the Independent Variables to the Dependent Variable (Test of Significance of the Regression Coefficients)

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	CI
	B	Std Error	Beta			
(Constant)	17.426	3.284		5.307	.000	(10.951, 23.901)
Social Media Use Intensity	0.398	0.057	0.312	6.982	.000	(0.286, 0.510)
Cyberbullying Victimization	0.735	0.065	0.526	11.308	.000	(0.607, 0.863)
Online Peer Support	-0.355	0.064	-0.241	-5.547	.000	(-0.481, -0.229)

The constant term was also statistically significant ($B = 17.426$, $p < .05$), suggesting that even in the theoretical absence of the measured independent variables (social media use intensity, cyberbullying victimisation, and online peer support), a baseline level of anxiety would still be present among the adolescents. This finding acknowledges that anxiety is influenced by multiple factors beyond those examined in this study.

Table 5 also presents the regression analysis results, including the 95% confidence intervals for each coefficient. The coefficient for Cyberbullying Victimization was found to be 0.735 (95% CI: 0.607 to 0.863), indicating that as cyberbullying victimisation increases, anxiety levels are expected to rise, with a high degree of statistical certainty. Similarly, the Social Media Use Intensity coefficient was 0.398 (95% CI: 0.286 to 0.510), which suggests a positive relationship with anxiety levels. Conversely, Online Peer Support showed a negative relationship with anxiety ($\beta = -0.355$, 95% CI: -0.481 to -0.229), highlighting its potential protective effect.

3.2. Discussion

The present study offers critical insights into the complex relationships between digital behaviours—specifically social media use intensity, cyberbullying victimisation, and online peer support—and anxiety among adolescents in Oyo Town, Nigeria. The average anxiety score ($M = 28.35$) notably exceeds the clinical cutoff of 25 on the SCARED scale, signalling a considerable prevalence of anxiety symptoms. This finding is clinically significant and sociologically telling, reflecting broader psychosocial stressors within this demographic. The model's explanatory power ($R^2 = 0.643$) confirms that digital

factors collectively account for a substantial portion of adolescent anxiety variance, underscoring digital ecology's profound influence on youth mental health.

The positive association between social media use intensity and anxiety ($r = 0.483$; $\beta = 0.312$) aligns with findings that demonstrate that high engagement on social platforms often predicts elevated psychological distress [19] and [6]. However, this study extends the conversation to a less-researched, rapidly digitalising African context. Nigerian adolescents often engage online with limited adult supervision or formal digital literacy, exacerbating their vulnerability to content-driven anxiety. Mechanisms such as negative social comparison, fear of missing out (FoMO), sleep disruption, and displacement of anxiety-buffering activities are particularly salient [20]. These pathways are compounded by Nigeria's high youth unemployment, exam pressures, and a fragmented mental health infrastructure, all of which can amplify digital stressors into chronic psychological burdens.

Cyberbullying victimisation emerged as the strongest predictor of anxiety ($r = 0.652$; $\beta = 0.526$), a pattern consistent with meta-analytic evidence and significantly more pronounced than in many Western samples [21], [10]. In collectivist cultures like Nigeria, where identity and belonging are deeply interwoven with group perception [22], public humiliation or exclusion online may be perceived as existential threats to social standing. The anonymity, permanence, and viral reach of digital aggression intensify these threats, often evading traditional support systems. In Nigeria's culture, adolescents may be hurt more deeply by cyberbullying because their reputation and social standing matter more to their sense of self than in cultures that emphasise individual identity.

Conversely, online peer support demonstrated a modest yet significant protective association with anxiety ($\beta = -0.241$), echoing [13] and supporting the stress-buffering hypothesis [23]. This highlights that digital environments, while risk-laden, also host opportunities for connection and emotional resilience. However, the limited magnitude of this buffer relative to the other predictors suggests structural and cultural barriers to effective peer support in the Nigerian context. Infrastructural constraints (e.g., limited access to private internet or safe online forums), social norms discouraging emotional openness, and stigma around mental health may suppress the visibility or efficacy of digital support networks. This finding calls for culturally tailored interventions that do not merely replicate Western models of peer-based support but actively co-create safe, affirming online spaces with Nigerian youth.

While the relationships identified between social media use intensity, cyberbullying victimisation, and anxiety levels are compelling, it is important to emphasise the cross-sectional nature of this study. The correlational design limits the ability to infer causal relationships, and thus, caution should be exercised when concluding the directionality of these effects. Although our findings suggest that social media use and cyberbullying victimisation are associated with higher anxiety levels, future research utilising longitudinal or experimental designs is needed to establish causality more definitively. As noted by previous research, the temporal nature of anxiety's relationship with digital behaviours requires further exploration, especially to understand whether digital

engagement exacerbates pre-existing vulnerabilities or whether anxiety might predispose adolescents to more frequent online engagement [31, 32].

An important consideration not addressed in this study is the potential interaction or moderation effects between variables. For example, future research could examine whether the protective impact of online peer support varies based on the severity of cyberbullying exposure or gender. Previous studies suggest that adolescents' coping mechanisms in online environments may differ by gender, with females potentially being more affected by relational aggression, such as cyberbullying, while males may show more substantial peer group reliance for emotional support [33, 34]. Additionally, the severity of cyberbullying could modify the extent to which online support provides psychological relief. The absence of such analyses in this study is a limitation, and future research should explore these potential moderations to deepen the understanding of how digital experiences interact with adolescent anxiety.

The high joint variance explained by the three digital factors (64.3%) exceeds typical figures reported in studies [19], which generally range from 30–45%. This disparity may reflect Nigeria's accelerated yet unregulated digital penetration, where infrastructural lag in policy, education, and parental mediation may expose adolescents more to online life's emotional volatility. The results provide empirical validation for the [24] socio-ecological model of digital well-being, which posits that individual, relational, and systemic factors intersect to shape youth mental health outcomes in online contexts.

The regression hierarchy offers strategic insights for intervention prioritisation. Cyberbullying victimisation's primacy ($\beta = 0.526$) implies that addressing digital aggression—rather than broadly restricting screen time—should be the foremost policy and programmatic goal. Restrictive approaches alone may prove insufficient, or even counterproductive, if they ignore the relational quality of online interactions. Instead, comprehensive cyber safety programmes, including anonymous reporting systems, restorative justice mechanisms, and peer-led anti-bullying campaigns, are recommended [25]. Similarly, the notable role of social media intensity ($\beta = 0.312$) suggests that media literacy education, digital self-regulation tools, and parental guidance frameworks should be embedded in Nigeria's educational curricula. Facilitating online peer communities that foster empathy, shared identity, and prosocial behaviour could harness the buffering potential of digital connectedness while mitigating risk exposure.

Several context-specific considerations emerged. The elevated anxiety levels in this sample—exceeding normative values in comparable international studies—may reflect intersecting stressors unique to Nigerian youth: economic precarity, social instability, high academic expectations, and sociopolitical uncertainty. Furthermore, the amplified impact of cyberbullying may be partially explained by religio-cultural norms that attach high value to modesty, reputation, and public morality—factors that can deepen the psychological impact of online shame and harassment [26]. Meanwhile, the comparatively underdeveloped online support structures highlight the digital gap in psychosocial resources and suggest a need for culturally sensitive platforms that cater to Nigeria's heterogeneous adolescent populations.

These findings have several practical and policy implications. Educational institutions should integrate digital citizenship curricula beyond functional literacy, including emotional literacy, critical consumption, and online conflict resolution. Mental health services must build digital competence into adolescent care, equipping professionals to address technology-mediated stress. Governmental and NGO partners could co-develop moderated online peer support groups using culturally resonant narratives to build trust and participation. Given the explained variance of 64.3%, digital mental health must move from the periphery of adolescent well-being discourse to its centre, especially in LMICs like Nigeria, where formal mental health infrastructure remains inadequate.

Beyond these applied recommendations, the study also holds significant theoretical implications. The strong predictive effect of cyberbullying on anxiety may be particularly pronounced in collectivist cultural contexts like Nigeria, where social identity is deeply embedded in group belonging and public perception. In such societies, online humiliation, exclusion, or digital harassment may carry amplified psychological consequences due to the heightened value placed on communal harmony, social reputation, and interpersonal interdependence. Unlike in individualist cultures where personal autonomy and privacy buffer the effects of peer-based conflict, Nigerian adolescents may experience cyberbullying as a direct threat to familial pride and social standing, thereby intensifying anxiety. This supports the theoretical proposition that cultural context moderates the psychological outcomes of digital behaviours, highlighting the need for context-specific models of adolescent mental health in digital environments.

Nonetheless, limitations temper the interpretation of these findings. The cross-sectional design precludes causal inference, and reciprocal or mediating pathways (e.g., depression, family dynamics) remain unexplored. The geographic specificity of Oyo Town limits generalisability across Nigeria's diverse regions. Self-reporting instruments may introduce desirability bias or limit the precision of constructs such as "peer support" or "intensity." Moreover, 35.7% of the variance in anxiety remains unaccounted for, potentially explained by variables such as sleep quality, parenting style, school climate, or neurodevelopmental predispositions. Future studies must adopt longitudinal and multi-method designs, integrating psychophysiological, observational, and qualitative data to triangulate complex pathways between digital behaviour and mental health.

Additionally, the generalizability of these findings may be influenced by sociotechnical disparities in Nigeria. Internet access and digital literacy vary significantly between urban and rural areas, which could impact the experiences of adolescents in different regions. Adolescents in more rural locations, for example, may have limited access to social media platforms or use them differently from those in more urbanised settings. Furthermore, the study sample focused on Oyo Town, which may not fully represent adolescents in other regions of Nigeria with different cultural or infrastructural contexts. When applying the findings to other Nigerian adolescents, these regional and sociotechnical factors should be considered.

To advance this critical field, future research should pursue longitudinal modelling to identify causal sequences and sensitive developmental windows for intervention. Comparative studies across Nigeria's geopolitical zones may reveal regional variations in

digital risks and supports, enhancing policy relevance. Moreover, implementation studies of evidence-based digital interventions—such as school-based cyberbullying programmes or app-mediated peer support—can bridge the gap between theory and practice. Lastly, qualitative inquiry into adolescents' lived digital experiences in Nigeria would offer rich interpretive depth, uncovering how youth construct meaning around digital interactions and psychological well-being in evolving sociotechnical settings.

5. CONCLUSION

This study provides compelling evidence for the significant relationships between digital experiences and adolescent mental health within the specific context of Oyo Town, Nigeria. The research successfully addressed the identified gap in understanding how social media use, cyberbullying exposure, and online peer support collectively influence anxiety levels among Nigerian adolescents in smaller urban centres. The study's primary findings demonstrate that digital factors play a substantial role in adolescent anxiety, with the three examined variables collectively explaining 64.3% of the variance in anxiety levels. Cyberbullying victimisation emerged as the most potent predictor of anxiety ($\beta = .526$), indicating that addressing digital aggression should be the foremost priority in mental health promotion efforts. This finding is particularly significant within Nigeria's collectivist cultural context, where reputation and social standing carry profound psychological weight. Social media use intensity demonstrated a substantial positive relationship with anxiety ($\beta = .312$), while online peer support served as a significant protective factor ($\beta = -.241$), highlighting the potential for positive digital connections to buffer against psychological distress.

The elevated mean anxiety score ($M = 28.35$) observed in this sample, which exceeds the clinical cutoff threshold, raises important concerns about the mental health status of adolescents in Oyo Town. This finding, combined with the substantial explanatory power of digital factors, positions technology-mediated experiences as central concerns in adolescent mental health discourse within Nigeria.

The study's limitations must be acknowledged, including the cross-sectional design that precludes causal inference and the substantial unexplained variance (35.7%), indicating that additional factors contribute to adolescent anxiety levels. The geographic specificity also limits generalizability across Nigeria's diverse regions. Despite these limitations, this research contributes to adolescent digital well-being literature in African contexts. The findings highlight the urgent need for culturally responsive approaches to cyberbullying prevention, digital literacy education, and online peer support facilitation within Nigeria's rapidly evolving digital landscape. As Nigeria continues its trajectory toward increased digital connectivity, this study represents an important foundation for developing comprehensive, culturally appropriate strategies for promoting adolescent well-being in the digital age.

Recommendations

Based on the findings of this study, the following practical recommendations are proposed:

Policymakers must institutionalise digital mental health education in secondary schools by adopting a national curriculum framework where emotional literacy and digital skills are the priorities. In addition to teaching students to operate technology, the curriculum must provide them with skills to critically analyse online information, control the risk of cyberbullying, and establish positive digital routines. Budgets should be set aside to train the teachers, develop resources, and monitor them continuously to implement them effectively. Since the most potent predictor of anxiety in your study was cyberbullying victimisation, a policy requirement that all secondary schools should develop a cyberbullying prevention framework with effective reporting systems and culturally relevant penalties would be needed to reduce the psychological damage caused by technology.

As frontline players in the development of adolescents, teachers ought to incorporate the content of digital well-being in their daily teaching and pastoral work. This includes the ability to initiate organised classroom discussions about cyber safety and peer relationships in the online environment and the ability to detect behavioural indicators indicative of anxiety caused by digital stressors. Teachers ought to receive training to be able to identify the indicators of online victimisation, sleep disturbance, or withdrawal that might be a sign of distress, and make supportive referrals to school-based mental health services. Safe spaces can also be created through the encouragement of peer-led support circles, which are supervised but student-driven and allow adolescents to share their online experiences and develop resilience together.

The NGOs involved in youth development ought to invest in community-based, moderated digital peer support networks that are specific to the realities of adolescents in Nigeria. These platforms need to be co-created with young people and integrated into existing platforms they are using (like WhatsApp or Facebook Messenger), and well-moderated to provide emotional safety and inclusivity. These networks can potentially be low-cost, scalable interventions to mitigate social isolation, especially among adolescents lacking robust offline support systems. NGOs can address stigma and promote participation in mental health discourse by using culturally relevant language, narrative, and standards of respect and empathy.

An inter-sectoral partnership between the government, civil society, and educational institutions ought to be established to provide specific campaigns that would disrupt negative online behaviours and enhance digital citizenship. Such campaigns must go beyond awareness posters and instead use short-form video, music, and spoken word expressions that speak to adolescent subcultures. It is possible to raise credibility and reach by involving influencers, religious leaders, and youth ambassadors. It should also be aimed at campaigns that seek to end stigma related to online peer support and mental health issues, particularly in collectivistic cultural contexts where stigma related to shame and reputation plays a significant role in the help-seeking behaviour of such individuals.

School-based counselling and other mental health services should be transformed to reflect the new realities of digital anxiety in adolescents. This involves the inclusion of digital competence in counselling training programmes and the offer of tools that can help counsellors evaluate and manage technology-mediated stressors like overuse of social

media or trauma related to cyberbullying. Such services must also collaborate with digital platforms and community stakeholders, to which they can refer cases that require further clinical intervention or digital risk reduction. In the absence of such evolution, mental health care will be out of touch with one of the most powerful sources of adolescent distress in the current fast-digitising Nigeria.

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