Perceived violation of patient privacy rights in game-based counseling environment: A student perspective in south-east Nigerian universities

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Abstract
The rapid integration of digital health interventions into clinical practice, particularly game-based digital therapeutics such as EndeavorRx, has raised important legal, ethical, and clinical concerns regarding patient rights. While EndeavorRx has demonstrated effectiveness in treating pediatric Attention-Deficit/Hyperactivity Disorder (ADHD), its use of cloud telemetry, behavioral tracking, and algorithmic profiling poses potential risks to privacy and confidentiality. This study examined students' perceptions of patient privacy violations associated with prescription video games in selected universities in Southeast Nigeria. A convergent parallel mixed-methods design was employed, involving 450 undergraduate and postgraduate students selected through multistage stratified random sampling. Data were collected using structured questionnaires and focus group discussions. Quantitative data were analyzed using descriptive statistics and Chi-square tests, while qualitative data were examined through thematic analysis. Findings revealed a significant level of student understanding of embedded behavioral tracking mechanisms ($\chi^2 = 20.706$, $p = .002$). Respondents also perceived prescription video games as posing substantial privacy risks ($\chi^2 = 42.000$, $p < .001$) and emphasized the need for stronger enforcement of existing regulations, including the Nigeria Data Protection Act, 2023 ($\chi^2 = 43.765$, $p < .001$). Qualitative results reinforced these concerns, highlighting issues related to informed consent, unauthorized data access, and continuous monitoring. The study underscores the need for robust ethical governance, transparent data stewardship, and context-specific regulatory frameworks to safeguard patient privacy in the implementation of prescription video game therapeutics within clinical and educational settings in sub-Saharan Africa.

1. Introduction

The advent of digital technology and mental health care has transformed the way therapy is delivered – replacing in-person counselling with immersive software-based treatments (Torous et al., 2021). Prescription video games (PVGs), such as EndeavorRx (developed by Akili Interactive), are among these innovations; they are Food and Drug Administration (FDA) approved digital therapeutics that treat specific neurological conditions such as Attention-Deficit/Hyperactivity Disorder (ADHD). The basic principle of these gamified interventions is to directly target and stimulate neural systems that underlie attentional control through dynamic and adaptive gameplay mechanics (Kollins et al., 2021; Huang et al., 2024).

Digital therapeutics (DTx) have revolutionized the field of mental health care for children, providing novel software-based tools to complement clinical therapies. Akili Interactive's EndeavorRx is a groundbreaking, FDA-cleared prescription video game targeted to address attention deficits in children with ADHD. As a game-based counselling platform, it incorporates sensory stimuli and motor challenges within the game to stimulate and activate neural systems that are involved in cognitive control (Keutayeva et al, 2026). Patients solve cognitive rehabilitation goals in interactive virtual worlds making cognitive rehab fun and entertaining. Adding these gamed interventions to therapy helps to offer structured nonpharmacological support for children and young people (Litvin et al, 2020). The studies indicate that in real-time, algorithm adjustments ensure optimal cognitive load for pediatric users, which supports them in improving their selective attention and working memory capacity (Pramana et al, 2018). The therapeutic software provides ongoing performance feedback and can be used by clinicians to track the longitudinal focus trends as well as conventional behavioral counselling. Prescription video games are not a substitute for primary clinician guidance or indicated pharmaceuticals, however, digital intervention environments can provide therapeutic modalities that are accessible and non-invasive, helping to increase adherence to treatment and lessen ADHD associated impairments.

As a complementary digital therapeutic, EndeavorRx is a non-pharmacological treatment within clinical counseling methods. The software is integrated with a traditional treatment program that includes behavioral therapy, psychoeducation, and pharmacology treatment (Evans et al, 2021). Therapists can monitor the

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performance alongside subjective behavior metrics by the real-time adaptive algorithms which continuously track player performance in the game.Real-time adaptive algorithms continuously track player performance and give objective performance telemetry for the therapists to monitor along with subjective behavioral metrics. EndeavorRx facilitates adherence to intervention for children and adolescents with Attention-Deficit/Hyperactivity Disorder (ADHD) by providing structured cognitive training delivered via an engaging medium. The use of gamification in this approach facilitates the connection between clinical sessions and home practice (Oh et al., 2024). In conclusion, EndeavorRx is an innovative and data-informed solution that can bolster cognitive function and working memory in children and other daily activities by being integrated into comprehensive counseling services.

But the process of operation of such clinical software depends on frequent and regular data collection. PVGs require ongoing behavioral tracking, continuous motor-response monitoring, cloud-based telemetry and sophisticated algorithm processing in real time to optimize algorithmic treatment. The technical specifications leave room for a built-in conflict between clinical effectiveness and safeguarding vulnerable patient health information. Fine-grained telemetry data including reaction time, error rates, and interaction rates—can be gathered by gamified software and used to feed into constant surveillance feeds, raising the likelihood of inadvertent data exposure, third-party data profiling, and algorithmic bias (Ashworth et al., 2026). Although the clinical effectiveness outcomes of digital therapeutics, their symptom reduction and regulatory approval processes are central to the global research and public conversation, the socio-legal aspects, particularly patient privacy rights, have been largely under-researched and under-discussed in the context of digital therapeutics in developing ecosystems such as Nigeria (Iheanachor et al., 2023). As mobile technology spreads across sub-Saharan Africa at a surprisingly fast pace, it outpaces institutions' ability to regulate the delivery of healthcare through alternative channels, leaving mobile gamified health tools in a regulatory limbo.

South-East Nigerian universities host diversified student populations trained at the forefront of technology, psychology, law, healthcare and more. Digital literacy and socio-technological conversations are central in higher education institutions like University of Nigeria, Nsukka (UNN), Nnamdi Azikiwe University (UNIZIK), and Enugu State University of Science and Technology (ESUT) in this region. Such academic communities have a particular, transdisciplinary perspective on the moral limits of digital health surveillance, data ownership, informed consent, and systemic security vulnerabilities (Lupton, 2017). The critical assessment of software governance and the readiness for deployments of software-as-a-medical-device (SaMD) that is offered by university students is invaluable as they are early adopters and future clinicians and technologists.

To build game-based digital therapeutics into clinical counseling, there is a need for real-time behavioral monitoring and cloud telemetry, which introduces large structural data privacy issues. Although these issues of privacy over digital health platforms have been identified globally, the current literature is largely centered on developed digital economies in higher income areas, leaving a geographic disconnect in how to implement them in developing digital economies (Göçoğlu et al., 2025). Health privacy research in Nigeria is strongly geared towards traditional electronic health record (EHR) systems not interactive, dynamic health software interventions. Despite efforts to provide protection for personal metrics as in the Nigeria Data Protection Act of 2023, challenges in the enforcement of these frameworks include low awareness of the law and infrastructure limitations (Adaji, 2023; Aloamaka, 2023). This study on fills these critical empirical and theoretical gaps. The University of students in South-East Nigeria are early technology adopters, legal scholars and future health professionals. Assessing their understanding of telemetry tracking and safeguards will give important regional insights to ensure digital health innovation is consistent with core privacy rights.This assessment will give key region insights on awareness of telemetry tracking and safeguards, ensuring digital health innovation is aligned with core rights to privacy.

This study was guided by three research questions. First, it sought to determine the extent to which university students in South-East Nigeria understand the behavioral tracking mechanisms embedded in game-based digital therapeutics such as EndeavorRx. Second, it examined students' perceptions regarding the risk of patient privacy violations associated with interactions with prescription video game interventions. Third, the study investigated the extent to which students believe that existing institutional frameworks are adequate for safeguarding user privacy during the deployment of the EndeavorRx platform.

To address the objectives of the study, the following null hypotheses were formulated. The first hypothesis stated that university students in South-East Nigeria do not possess a significant level of understanding regarding the behavioral tracking mechanisms embedded in game-based digital therapeutics such as EndeavorRx. The second hypothesis stated that students do not perceive interactions with prescription video game interventions as presenting a meaningful risk of patient privacy violations. The third hypothesis stated that students do not perceive existing institutional frameworks as inadequate for safeguarding user privacy during the deployment of the EndeavorRx platform.

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2. Method

The study used a quantitative, cross sectional survey research design to examine the understanding, perceptions and views of university students about the institutional frameworks concerning prescription video games and behavioral tracking technologies. The design was selected because the researchers could systematically gather data from a specific target group at one time point to understand attitudes and perceptions without manipulation of the experiment. The study targeted University students who were enrolled in different Universities in South-East Nigeria. From the broader population, a representative sample was selected consisting of an equal number of students from both science and arts-related and social science academic disciplines and of varying levels of prior experience with digital health interventions.

The major research instrument was a structured questionnaire, which yielded the required information. The instrument was designed in a carefully structured manner where different sections are linked with the main research questions of the study. It included closed-ended questions with points on a Likert scale (from strongly disagree to strongly agree) questions on the scale of agreement with questions related to data privacy, behavioral telemetry and institutional regulation. The internal consistency and dependability of the research instrument were tested before the instrument was completed and ready for use. This usually entailed a pilot study or preliminary assessment to ensure items reliably assessed the construct of interest and the researchers could clarify any vague questions before final administration.

The instrument was administered in a systematic manner. The questionnaires were sent to the students of the sample group at the university and instructions were given to help them navigate the statements and understand the context of the digital therapeutics before they begin to fill out the questionnaire. Data collection was done systematically and questionnaires were collected, screened and arranged in a way to be processed. The data was cleaned and any missing or the wrong data was handled in an appropriate manner to ensure the data had integrity.

Data analysis used descriptive and inferential statistical techniques, which were used to interpret the result. Descriptive statistics were used to present the demographic characteristics of the respondents and to test the statistical central tendencies of the responses to the questionnaire items of the Likert scale with a cut-off value derived from the decision rule. In addition, inferential statistics were used, namely the Chi-Square test to test the formulated null hypothesis and to test the deviation of the observed distributions of responses from the theoretically expected distributions.

3. Results and Discussion

3.1. Results

The gender distribution of the study participants is shown in Table 1. The majority of the respondents were female (76, 74.5%) while the male respondents were 26 (25.5%). There were 26 male participants (25.5%). This shows a significant gender disparity, with more females than males taking the surveys. The findings of the study should be considered generalizable to the larger student population, taking into account this demographic skew.

Table 1. Distribution of Respondents by Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	26	25.5	25.5	25.5
	Female	76	74.5	74.5	100.0
	Total	102	100.0	100.0	

The distribution of participants by academic discipline is showed in Table 2. There are 102 respondents, 52 of which are from the Sciences (51.0%) and 50 are from Arts and Social Sciences (49.0%). This indicates a very good balance and even representation in terms of both academic area in the whole sample. The parity ensures that a variety of perspectives on digital health interventions are represented through the study, both technical and humanities.

Table 2. Distribution of Respondents by Academic Discipline

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Sciences	52	51.0	51.0	51.0
	Arts and Social Sciences	50	49.0	49.0	100.0
	Total	102	100.0	100.0	

Table 3 shows the respondents' perception of their awareness about the prescription video games. Most of the participants are aware of the subject, 72 students (70.6%) said they are somewhat familiar, and 18

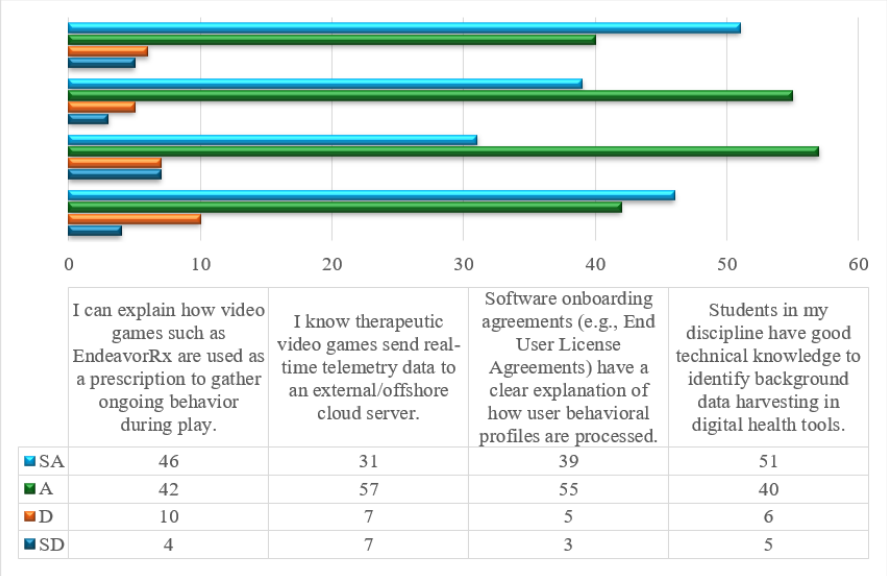
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students (17.6%) said they are very familiar. On the other hand, 12 students (11.8%) indicated no knowledge at all. This shows a basic level of understanding of what digital therapeutics are for most of those taking part in the sample at university, which could be used as a solid basis for informed responses on privacy and tracking.

Table 3. Distribution of Respondents by Familiarity with Prescription Video Games

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Familiar	18	17.6	17.6	17.6
	Somewhat Familiar	72	70.6	70.6	88.2
	Not Familiar at all	12	11.8	11.8	100.0
	Total	102	100.0	100.0	

Research Question 1: To what extent do university students in South-East Nigeria understand the mechanisms of behavioral tracking embedded in game-based digital therapeutics like EndeavorRx? Respondents' comments about their awareness of behavioral tracking in video games for prescription medicines are shown in Figure 1.



	I can explain how video games such as EndeavorRx are used as a prescription to gather ongoing behavior during play.	I know therapeutic video games send real-time telemetry data to an external/offshore cloud server.	Software onboarding agreements (e.g., End User License Agreements) have a clear explanation of how user behavioral profiles are processed.	Students in my discipline have good technical knowledge to identify background data harvesting in digital health tools.
SA	46	31	39	51
A	42	57	55	40
D	10	7	5	6
SD	4	7	3	5

Figure 1. Descriptive Statistics on Students' Understanding of Behavioral Tracking Mechanisms

The mean scores of all four questionnaire statements were high, well above the decision benchmark, ranging from 3.10 to 3.34 and were low with low standard deviations (0.69 to 0.81). This shows that there was a high degree of collective understanding that university students have about digital therapeutics collecting behavior, sending real-time telemetry, processing profiles through user agreements, and that they have technical awareness of data harvesting.

Hypothesis 1: University students in South-East Nigeria do not possess a significant level of understanding regarding the behavioral tracking mechanisms embedded in game-based digital therapeutics like EndeavorRx. Table 4 shows the results of the Chi-Square test used to assess the use of the university students regarding understanding of the behavioral tracking mechanisms embedded in game-based digital therapeutics like EndeavorRx, which tested the hypothesis of whether the university students have a significant amount of knowledge about the mechanisms of behavioral tracking in digital therapeutics.

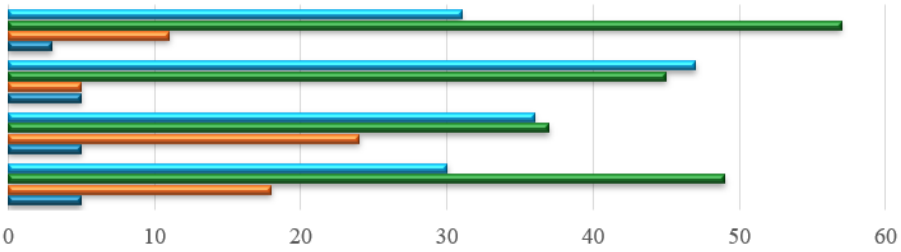
Table 4. Chi-Square Test Analysis for understanding of the behavioral tracking mechanisms embedded in game-based digital therapeutics like EndeavorRx

	Understanding of the behavioral tracking mechanisms embedded in game-based digital therapeutics like EndeavorRx
Chi-Square	20.706a
df	6
Asymp. Sig.	.002
a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 14.6.	

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The results of the analysis were a Chi-Square of 20.706, with 6 degrees of freedom, and an asymptotic significance value of .002. This p-value is well below the standard level of significance of 0.05, so the null hypothesis is rejected. This statistically significant result is an indication that University students in South-East Nigeria have a meaningful and significant knowledge of how game-based digital therapeutics track and harvest user behavior.

Research Question 2: What are students' perceptions regarding the risk of patient privacy violations when interacting with prescription video game interventions? Figure 2describes students' concerns about privacy threats related to prescription video game interventions.



	Prescription video games are actually a concrete threat to user privacy and can negatively impact the personal privacy of users.	Gamification of mental healthcare causes a false sense of security, causing people to be uninhibited with sensitive data.	Behavioral monitoring in counseling video games is equivalent to "digital surveillance" of vulnerable players.	Ethical issues are huge when it comes to gameplay-derived health data being monetized or shared secondarily for commercial purposes.
SA	30	36	47	31
A	49	37	45	57
D	18	24	5	11
SD	5	5	5	3

Figure 2. Descriptive Statistics on Students' Perceptions of Privacy Violation Risks

The mean of all four items of the questionnaire was recorded at high levels, consistently above the acceptance cut-off point, ranging from 3.02 to 3.31, with low standard deviations (0.70 to 0.79). This suggests that there is a level of agreement among respondents that digital health games are a real threat to privacy, allow users to believe that they are safe from privacy threats in relation to personal health data, serve as a form of digital surveillance of vulnerable users and create significant ethical issues related to the secondary commercial monetization of health data generated during gameplay.

Hypothesis 2: Students do not perceive interactions with prescription video game interventions as presenting a meaningful risk of patient privacy violations. Table 5shows the results of the Chi-Square test, which examined whether students feel that there is a meaningful threat to patient privacy with prescription video games.

Table 5. Chi-Square Test Analysis for perceived risk of patient privacy violations

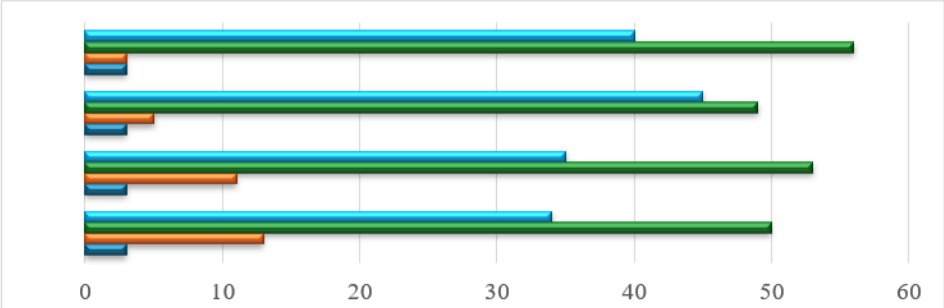
	Risk of patient privacy violations
Chi-Square	42.000[a]
df	7
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 12.8.

The results of the analysis gave a Chi-Square of 42.000 and 7 degrees of freedom and an asymptotic significance of .000. This p-value is well below the 0.05 level, so the null (or hypothesis) hypothesis is rejected. This statistically significant result supports the findings that university students believe there are real privacy concerns with interactions with prescription video game interventions.

Research Question 3: To what extent do students believe existing institutional frameworks are adequate for safeguarding privacy during the deployment of EndeavorRx? Figure 3 shows students' perspectives on whether current institutional structures are suitable to protect privacy in the use of prescription video games.

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	My university has relevant institutional policies that are sufficient to govern privacy in health interventions that use software.	Foreign-developed digital therapeutics are sufficiently regulated by the National data protection frameworks (e.g. the Nigeria Data Protection Act).	University counseling centers can audit digital health apps to check if there is unauthorized data telemetry leakage.	All game-based mental health tools need to be reviewed by a strict ethical review board prior to use with students or patients.
SA	34	35	45	40
A	50	53	49	56
D	13	11	5	3
SD	3	3	3	3

Figure 3. Descriptive Statistics on Students' Beliefs Regarding Institutional Frameworks

High mean scores and low standard deviations (0.66 to 0.75) were reported for all four items, where the means scores were all above the decision benchmark (3.00). Comments suggest high level of agreement by the respondents that there is need for university policies, National data protection legislations such as the Nigeria Data Protection Act, internal counselling audit and stringent ethical review board (ERB) examination to be effective and pertinent safeguards.

Hypothesis 3: Students do not perceive existing institutional frameworks as inadequate for safeguarding user privacy during the deployment of the EndeavorRx platform. Table 6 shows the results of the Chi-Square test examining students' beliefs about the adequacy of institutional structures for protecting user privacy when digital health platforms are implemented, which examined students' beliefs about the adequacy of existing institutional structures for protecting user privacy during the implementation of digital health platforms, such as EndeavorRx.

Table 6. Chi-Square Test Analysis for Students' Beliefs Regarding adequacy of institutional frameworks for safeguarding user privacy during the deployment of the EndeavorRx platform

	Students' Beliefs Regarding adequacy of institutional frameworks for safeguarding user privacy during the deployment of the EndeavorRx platform
Chi-Square	43.765[a]
df	6
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 14.6.

The analysis resulted in a Chi-Square of 43.765, degrees of freedom 6, and an asymptotic significance of .000, which makes the results significant. This p-value is less than 0.05, indicating that the null hypothesis is rejected. This statistically significant finding establishes that the university students have a defined and measurable opinion on the effectiveness, regulation, and adequate structure of existing policies within the institutions and laws at national level on data protection.

3.2. Discussion

As to the behavioral tracking, the descriptive statistics (means between 3.10 and 3.34) and Chi-Square test (χ^2=20.706, p=.002) show that students do have a good understanding of embedded telemetry mechanisms on a high level. This was consistent with Lupton (2017), who noted that the contemporary consumers of digital health tools are technologically savvy about algorithmic extraction and ongoing profiling of users. Likewise, this finding was consistent with Torous et al (2021), who noted a dramatic increase in the level of user literacy on background data collection for digital psychiatry as mobile app use has gone up. In a follow-up paper, Ashworth

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et al. (2026) observed that users of digital health technologies are becoming more aware of the intrusive aspect of systems that constantly monitor their behavior and health. But, unlike these findings, gamified healthcare users tend to value the interactive engagement and the usefulness of the clinical outcomes over understanding the technical aspects of the background tracking mechanics (Pramana et al., 2018).

In terms of privacy concerns, the descriptive data (Means ranged from 3.02 to 3.31) and Chi-Square analysis (χ^2=42.000, p=.000) indicate that game-based interventions pose real threats to patients' privacy and health information security. This study also aligns with Litvin et al. (2020), who pointed out that gamification of mental health services often leads to concerns among users regarding surveillance, monetization of data, and the possibility of data breaches. Iheanachor et al (2023) found that emerging market digital ecosystems in Nigeria are characterized by high levels of user anxiety over data security and secondary use of data. Conversely, the clinical assessments of software-as-a-medical-device interventions in these studies, e.g., those by Kollins et al. (2021), Evans et al. (2021), Huang et al. (2024) and Oh et al. (2024) have tended to prioritize clinical efficacy, symptom reduction, and therapeutic engagement in pediatric ADHD, with little attention paid to the subjective privacy concerns of end-users.

In terms of regulatory protections, the descriptive statistics (3.15-3.33) and Chi-Square analysis (χ^2=43.765, p=.000) shows that students have a high level of confidence in the need for strong institutional structures and ethical review boards that will help protect user privacy during platform deployment. It coincided with Aloamaka (2023) who discovered that existing data protection frameworks in Nigeria have implementation challenges that require proper legal supervision to protect users' data. Likewise, this finding was consistent with Adaji (2023) who underscored the need to create comprehensive legal frameworks that balance digital health use with the rights of individuals. In a related study, Göcólu et al. (2025) has pointed out that policy frameworks need to be updated to address challenges in digital security in developing economies on a global scale. In contrast, Keutayeva et al (2026) focused more on neurotechnological and therapeutic progress in game-based interventions rather than on the governance of data and institutional policies.

3.3. Implications for Digital Health Policy

The results on the perceptions of students of privacy issue in the game-based counseling environments in Nigerian universities show a significant contradiction between the use of technologies and the protection of data in the universities. Students express an awareness of digital therapeutics but their concerns about the monitoring of their behavior and their fear of data being accessed by others signal serious issues with unapproved exploitation of data. This is reflective of the other intellectual property and copyright issues that can be noticed across the creative industries which involves the digital piracy affecting institutional integrity (Nwadigwe & Ilukwe, 2023). In addition, the unabated commercialization of digital content mirrors the thematic analysis of antagonism, dissent and revolutionary structures which are evident in African dramatic literature (Ilukwe & Ume, 2025). The power differential also highlights the fact that the digital platforms are not necessarily free of exploitation by corporate developers of vulnerable users due to the inherent power differentials between them and users (Agoha et al., 2026).

The introduction of foreign digital health tools in local academic environment highlights the continued conflict of globalization and indigenous socio-cultural frameworks. The use of external technological interventions involves balancing the foreign software with local values as discussed in scholarly works on globalization, cultural adaptation and national integration (Ilukwe, 2021; Ilukwe, 2025a). Like art adaptations, which need to navigate external influences while maintaining cultural authenticity (Ilukwe, 2025b), digital health implementations need to be respectful to domestic regulatory boundaries. Furthermore, the maintenance of cultural identity and the symbolic values of the cultural domain explored through cultural performances, dance communication and cultural artefacts show the resilience of indigenous frameworks against external homogenisation (Utoh-Ezeajugh & Ume, 2025; Ume & Akas, 2021; Okeke & Akunne, 2023). This cultural resilience shows that digital therapeutics imported simply cannot be taken on board without careful local examination.

The empirical results indicate the need for strong institutional policies, ethical review boards and legal enforcement like the Nigeria Data Protection Act, to reduce privacy violations. As society experiences digital disruptions, educational institutions should engage with them proactively by analyzing the digital media and providing educational awareness on its impacts (Ilukwe, 2026; Ilukwe & Ume, 2026). In addition, the growth of institutions in the wider creative and developmental sectors in Nigeria showcases the importance of policy and national vision in shaping sustainable national development (Ilukwe, 2025a). In conclusion, the protection of student privacy within the context of game-based counselling in Nigeria should be reinforced through the strengthening of institutional frameworks within the universities, aimed at bridging the technological gap between innovation and accountability for student well-being.

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4. Conclusion

The potential paradigm shift in mental health treatment provided by games or digital therapeutics, including EndeavorRx, presents a number of socio-legal questions given the need for ongoing monitoring and data analysis via telemetry and a cloud service. The present study examined the perceptions of university students from the South-East region of Nigeria on behavioral tracking, threats to privacy and institutional protections in the context of gamified counseling. The aim of the study was to explore the perceptions of university students in the South-East region of Nigeria, about behavioral tracking, threats to privacy and institutional protections in gamified counseling contexts.

Students are highly conscious of the means of obtaining behavioral data from digital health software. Most importantly, these "gamified" interventions are clearly perceived by respondents as a violation of patient privacy rights, representing critical concerns about an ever-present surveillance of patients, false sense of security, and the commercial exploitation of patient data. Furthermore, the results suggest that robust regulatory frameworks should be put in place, which is already available in the Nigeria Data Protection Act (NDPA) 2023, and that ethical review boards and counselling audits are necessary at the university level to ensure the ethics of the platform deployment. While the use of prescription games offers potential for therapeutic interventions, it needs careful balance between innovation and effective data management if these games are to be applied into sub-Saharan healthcare systems. Keeping patients' trust and the fundamental principle of confidentiality intact requires collaboration among software developers and mental health professionals and policymakers in the African digital realm to develop transparent models for patient consent, limits on telemetry and enforceable data privacy protocols.

Author Contributions

All authors have equal contributions to the paper. All the authors have read and approved the final manuscript.

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Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/ or publication of this article.

Data Availability

The datasets generated during and/ or analysed during the current study are available from the corresponding author on reasonable request.

Declaration on AI Use

The authors declare that no artificial intelligence (AI) or AI-assisted tools were used in the preparation of this manuscript.

References

Adaji, A. E. (2023). Reconciling the ideals of open science with data privacy in the context of health research in Nigeria: A legal analysis. *Research Square*. https://doi.org/10.21203/rs.3.rs-

Agoha, K. U., Azogu, I. I., & Ume, J. A. (2026). Performing objectification: Analysing gendered power dynamics in the comedy skits of Mr. Macaroni and Kelvinblak. *International Journal of Sub-Saharan African Research, 3*(4), 679–690.

Aloamaka, P. A. (2023). Data protection and privacy challenges in Nigeria: Lessons from other jurisdictions. *UCC Law Journal, 3*(1), 281–321.

Ashworth, G., McKeown, A., & Tully, J. (2026). Ethical issues in the use of electronic monitoring (Global Positioning System tracking technology) in forensic mental health settings: A four-principles approach. *Medicine, Science and the Law, 66*(3), 254–262.

Evans, S. W., Beauchaine, T. P., Chronis-Tuscano, A., Becker, S. P., Chacko, A., Gallagher, R., Hartung, C. M., Kofler, M. J., Schultz, B. K., Tamm, L., & Youngstrom, E. A. (2021). The efficacy of cognitive videogame training for ADHD and what FDA clearance means for clinicians. *Evidence-Based Practice in Child and Adolescent Mental Health, 6*(1), 116–130. https://doi.org/10.1080/23794925.2020.1830208

Göçoğlu, V., Demirkol, A., Düzsöz, E., & Göçoğlu, İ. D. (2025). Shifting digital priorities for the SDGs: A global analysis on economic and geographic scales. Telecommunications Policy. *Advance online publication*. https://doi.org/10.1016/j.telpol.2025.103032

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ISSN: 3110-2557

Huang, S., Zhang, T., Lu, Q., Xiong, X., Liu, Z., & Sun, D. (2024). Clinical study on the intervention effect of digital therapy on children with attention deficit hyperactivity disorder (ADHD). *Scientific Reports, 14*(1), Article 23733. https://doi.org/10.1038/s41598-024-23733-x

Iheanachor, N., Umukoro, I., & Aranega, A. Y. (2023). Ecosystem emergence in emerging markets: Evidence from the Nigerian digital financial services ecosystem. *Technological Forecasting and Social Change, 190,* Article 122426. https://doi.org/10.1016/j.techfore.2023.122426

Ilukwe, E. (2026). Social media skit-making and the rise of Neo-Nollywood: Analyzing Nigerian comedy skits. *Ékwé International Journal of Igbo Scholars Forum for Socio-Cultural Advancement,* 19(1), 410–447.

Ilukwe, E. E. (2021). Globalization, culture and national integration in Nigerian drama: A study of Wole Soyinka's Death and the King's Horseman. *In Culture, Society and Development in Nigeria: Issues, Challenges and Prospects (Vol. 1,* Issue 1).

Ilukwe, E. E. (2025a). The Nigeria film industry and national development. *Advanced Journal of Theatre and Film Studies, 3*(1), 19–29.

Ilukwe, E. E. (2025b). The influence of culture on adaptation: A comparative study of William Shakespeare's Othello and Ahmed Yerima's Otaelo. *PREORC Journal of Arts and Humanities, 10.*

Ilukwe, E. E., & Ume, J. A. (2026). Using theatre for development to teach social media's impact on Nigeria's justice system: A case study at COOU Law Faculty. *Journal of Interdisciplinary and Multidisciplinary Research, 12*(1), 6367–6376.

Ilukwe, E., & Ume, J. (2025). Heroism and antagonism in African revolutionary theatre: A study of Esiaba Irobi's dramatic techniques in Sycorax. *Ofuruma: Journal of the Humanities, 5*(1–2), 1–11.

Keutayeva, A., Zollanvari, A., & Abibullaev, B. (2026). Neurofeedback: Advancing cognitive control in ADHD through therapeutic gaming. *In Bridging the Gap Between Mind and Machine: Exploring the Future of Human-AI-Neurotechnology Integration* (p. 131). Springer.

Kollins, S. H., Childress, A., Heusser, A. C., & Lutz, J. (2021). Effectiveness of a digital therapeutic as adjunct to treatment with medication in pediatric ADHD. *npj Digital Medicine, 4*(1), Article 58. https://doi.org/10.1038/s41746-021-00429-0

Litvin, S., Saunders, R., Maier, M. A., & Lüttke, S. (2020). Gamification as an approach to improve resilience and reduce attrition in mobile mental health interventions: A randomized controlled trial. *PLOS ONE, 15*(9), e0237220. https://doi.org/10.1371/journal.pone.0237220

Lupton, D. (2017). *Digital health: Critical and cross-disciplinary perspectives.* Routledge. https://doi.org/10.4324/9781315648835

Nwadigwe, C. E., & Ilukwe, E. E. (2023). Copyright law and the challenge of piracy on Nollywood business. *Ama: Journal of Theatre and Cultural Studies, 15(*1).

Oh, S., Choi, J., Han, D. H., & Kim, E. (2024). Effects of game-based digital therapeutics on attention deficit hyperactivity disorder in children and adolescents as assessed by parents or teachers: A systematic review and meta-analysis. *European Child & Adolescent Psychiatry, 33*(2), 481–493. https://doi.org/10.1007/s00787-022-02130-8

Okeke, T. J., & Akunne, J. U. (2023). The significance of cultural symbols in Ogbo traditional war dance. *Ama: Journal of Theatre and Cultural Studies, 15*(1).

Pramana, G., Parmanto, B., Lomas, J., Lindhiem, O., Kendall, P. C., & Silk, J. (2018). Using mobile health gamification to facilitate cognitive behavioral therapy skills practice in child anxiety treatment: Open clinical trial. *JMIR Serious Games, 6*(2), e8902. https://doi.org/10.2196/games.8902

Torous, J., Bucci, S., Bell, I. H., Kessing, L. V., Faurholt-Jepsen, M., Whelan, P., Carvalho, A. F., Keshavan, M., Linardon, J., & Firth, J. (2021). The growing field of digital psychiatry: Current evidence and the future of apps, social media, chatbots, and virtual reality. *World Psychiatry, 20*(3), 318–335. https://doi.org/10.1002/wps.20883

Ume, J. A., & Akas, N. C. (2021). Symbols as vectors of meaning in dance communication: A study of Egwuike dance. *Nigerian Journal of African Studies, 3*(2), 2734–3146.

Utoh-Ezeajugh, T., & Ume, J. A. (2025). Dance costumes as expressions of cultural identity: A study of selected cultural dances. *Frontiers in Art and Design, 1*(1), 34–34.

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