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PERCEPTIONS OF THE INTEGRATION OF ARTICICIAL INTELLIGENCE INTO THE HEALTH CARE SYSTEM AMONG HEALTH PROFESSIONALS IN NIGERIA

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Abstract

AI is transforming healthcare systems. However, its integration into the healthcare system in Nigeria remains limited. This study investigated perceptions of AI integration, assessing the awareness of AI among healthcare professionals, its influence on health information, and challenges affecting its adoption. Anchored on the Technology Acceptance Model, the study employed a descriptive survey design and engaged 400 healthcare professionals and hospital administrators across health institutions in Nigeria. Data were gathered through structured questionnaires and in-depth interviews and analyzed using descriptive statistics. Findings showed that 83.2% of professionals were familiar with AI. Respondents agreed that AI enhances the accuracy of health information (86.0%), improves medical data interpretation (86.5%), and supports decision-making. Key challenges included insufficient infrastructure (78.9%), high implementation costs (78.9%) and shortage of trained personnel (79.7%). Qualitative findings confirmed that AI improves clinical decision-making and operational efficiency. The study concludes that healthcare professionals in Nigeria recognize the substantial benefits of AI, but its integration remains constrained by infrastructural, financial, and human-capacity challenges. The study recommends sustained investment in digital infrastructure and workforce capacity development for AI-driven healthcare systems in Nigeria.

Keywords: ***Artificial intelligence in healthcare, Digital health transformation, Healthcare information, Healthcare systems in Nigeria.***

PERCEPTIONS DE L'INTEGRATION DE L'INTELLIGENCE ARTIFICIELLE DANS LE SYSTEME DE SANTE CHEZ LES PROFESSIONNELS DE SANTE AU NIGERIA

Résumé

L'intelligence artificielle (IA) transforme les systèmes de santé. Cependant, son intégration au sein du système de santé nigérian demeure limitée. Cette étude a examiné les perceptions de l'intégration de l'IA, évaluant la sensibilisation des professionnels de santé à l'IA, son influence sur l'information sanitaire et les obstacles à son adoption. Fondée sur le modèle d'acceptation de la technologie (TAM), l'étude a utilisé une méthodologie descriptive et a interrogé 400 professionnels de santé et administrateurs hospitaliers au sein d'établissements de santé nigérians. Les données ont été recueillies au moyen de questionnaires structurés et d'entretiens approfondis, puis analysées à l'aide de statistiques descriptives. Les résultats ont montré que 83,2 % des professionnels connaissaient l'IA. Les répondants s'accordent à dire que l'IA améliore la précision de l'information sanitaire (86,0 %), l'interprétation des données médicales (86,5 %) et soutient la prise de décision. Les principaux obstacles identifiés sont l'insuffisance des infrastructures (78,9 %), les coûts de mise en œuvre élevés (78,9 %) et la pénurie de personnel qualifié (79,7 %). Les résultats qualitatifs ont confirmé que l'IA améliore la prise de décision clinique et l'efficacité opérationnelle. L'étude conclut que les professionnels de santé nigérians reconnaissent les avantages considérables de l'IA, mais que son intégration reste freinée par des obstacles liés aux infrastructures, au financement et aux ressources humaines. L'étude recommande un investissement soutenu dans l'infrastructure numérique et le développement des capacités de la main-d'œuvre pour les systèmes de santé basés sur l'IA au Nigéria.

Mots-clés : ***Intelligence artificielle en santé, Transformation numérique de la santé, Information en santé, Systèmes de santé au Nigéria.***

Introduction

All over the world, Artificial Intelligence (AI) has become a central driver of transformation in healthcare information systems, enabling accurate diagnostics, real-time disease surveillance, predictive analytics, and efficient health data management. In advanced and emerging health systems, AI-powered technologies are routinely deployed in radiology, clinical decision support, electronic health records, and population health monitoring, leading to improved patient outcomes and reduced system inefficiencies (Hakkim et al., 2024; Mohajer-Bastami et al., 2025). International evidence shows that AI enhances early disease detection, minimizes human error, and supports data-driven health planning, particularly in managing epidemics and complex clinical workloads (Al-Nafjan et al., 2025; Fernandes Prabhu, 2025; Akhtar, 2025). As a result, many countries have integrated AI into national digital health strategies as a critical component of modern healthcare delivery (Karami, 2025). Beyond technological availability, the successful adoption of these AI-driven innovations has been strongly linked to healthcare professionals' perceptions of their usefulness and ease of use, factors that determine whether such technologies are accepted and integrated into routine healthcare practice.

The adoption of AI in Nigeria's health information system, however, remains limited and uneven. Despite Nigeria accounting for a significant proportion of Africa's disease burden, its healthcare system continues to struggle with fragmented and largely manual health information processes (Okwukwu et al., 2025; Mienye et al., 2024). In many public hospitals, patient records remain incomplete or paper-based, disease reporting is inconsistent, and real-time surveillance is weak. These challenges are exacerbated by inadequate funding, weak digital infrastructure, unreliable electricity supply, limited broadband coverage, and persistent

concerns around data privacy and security (Ali et al., 2023). Additionally, there is a shortage of skilled personnel capable of developing, managing, and effectively using AI-driven health information systems, alongside weak policy frameworks and limited institutional leadership to support large-scale AI implementation. From the perspective of the Technology Acceptance Model (TAM), these limitations may negatively influence healthcare professionals' perceptions of the ease of use of AI technologies, thereby reducing their willingness to adopt and utilize such systems in healthcare settings.

The consequences of these gaps are profound. Inefficient health information management undermines timely diagnosis, delays clinical decision-making, increases medical errors, and weakens the country's capacity to detect and respond to disease outbreaks (World Health Organization [WHO], 2021; Kruse et al., 2018; Ankolekar et al., 2024; Tshimula et al., 2024). Without structured AI-driven systems, Nigeria risks widening the digital health divide, limiting the efficiency of healthcare delivery, and failing to meet global health standards in an era where data-driven medicine is increasingly the norm (WHO, 2021; Topol, 2019). Furthermore, the absence of context-specific empirical evidence on how AI influences health information in Nigeria constrains informed policymaking and investment decisions (WHO, 2021; Federal Ministry of Health, 2021). Equally important is the limited understanding of how healthcare professionals perceive the usefulness of AI in improving health information management and whether they consider such technologies easy to learn and operate within existing healthcare environments. Since these perceptions are central determinants of technology adoption, understanding them is essential for successful AI implementation.

Although existing studies have extensively examined the general applications of AI in healthcare, most focus on high-income settings or discuss AI at a broad sectoral level without interrogating its specific implications for health information management (Bahadori et al., 2025; Olawade, 2024). Empirical studies that examine healthcare professionals' knowledge, experiences, and challenges regarding AI use in health information systems within the Nigerian context remain scarce (Barker et al., 2023). Moreover, few studies have explored these issues through the lens of technology acceptance, particularly by examining how perceptions of usefulness and ease of use influence healthcare professionals' attitudes toward AI adoption. This gap stresses the urgent need for systematic investigation. Consequently, this study examines the influence of artificial intelligence on health information in Nigeria. Specifically, the study seeks to: (i) assess the knowledge and awareness of Artificial Intelligence (AI) among healthcare professionals in Nigeria; (ii) examine the influence of AI on health information in Nigeria; and (iii) identify the challenges preventing effective implementation of AI in healthcare facilities in Nigeria.

Methodology

The study adopted a sequential explanatory mixed-methods design, combining quantitative and qualitative approaches to provide both breadth and depth of understanding on the influence of AI on health information management in Nigeria. The design involved the collection and analysis of quantitative data through structured questionnaires, followed by qualitative data gathered from in-depth interviews. The mixed-methods approach was considered appropriate because it allowed statistical measurement of relationships among variables while providing explanatory insights into patterns observed (Fetters & Tajima, 2022).

The research was anchored on the Technology Acceptance Model (TAM), which emphasizes perceived usefulness and perceived ease of use as key determinants of technology adoption (Ibrahim et al., 2025). The model informed the design of the research instruments, as the constructs guided the formulation of questionnaire items and interview questions assessing

awareness, perceived benefits, challenges, and willingness to adopt AI in health information management. The descriptive survey component quantified healthcare professionals' knowledge and experiences, while the qualitative phase provided contextual explanations for observed trends in AI application and perception among respondents.

The study was conducted across selected tertiary and secondary healthcare institutions in Nigeria's North-Central geopolitical zone, including facilities in Benue, Nasarawa, and Kogi States. This region was selected for its mix of urban and semi-urban hospitals that are gradually integrating digital health technologies. The target population comprised 400 healthcare professionals, including doctors, nurses, radiologists, radiographers, medical records officers, and hospital administrators. These professionals were considered key stakeholders in health information systems due to their roles in generating, managing, and utilizing patient data. For instance, doctors rely on AI-powered diagnostics, predictive analytics, and patient histories for decision-making and treatment planning, while nurses handle electronic health records (EHRs) and AI-assisted monitoring tools for real-time patient care. Radiologists use AI-based imaging systems for precise interpretation of X-rays, CT scans, and MRIs, medical records officers employ AI-supported data management systems to ensure accuracy and compliance, and hospital administrators apply AI to optimize hospital operations and policy implementation.

The sample size was determined using Cochran's (1977) formula for large populations of unknown size:

$$n = \frac{Z^2 * p * q}{e^2}$$

where n_o = Sample size; z = the selected critical value of desired confidence level (2.58); p = the estimated proportion of an attribute present in the population (0.5); q =1-p; and e = the desired level of precision (0.05). In the study, the calculation was based on a sample size of a large population whose degree of variability was unknown. The assumption was that the maximum variability was equal to 50% (p=0.5) and taking 95% confidence level with ±5% precision. It was thus applied as follows:

$$n = \frac{1{,}96^2 * 0.50 * (1 - 0.50)}{0.05^2}$$

Therefore, 384 participants were selected for the quantitative phase and 16 for the qualitative phase, making a total of 400 respondents. A multistage sampling technique was adopted to ensure adequate geographic coverage, institutional diversity, and professional representation across healthcare settings with varying levels of digital health adoption. In the first stage, the selection of states was done purposively. Benue, Nasarawa, and Kogi States were chosen because they host functional tertiary healthcare institutions, serve both urban and semi-urban populations, and exhibit varying levels of digital health infrastructure adoption. This variation provided a suitable context for examining levels of awareness, utilisation, and challenges associated with AI-based health information systems within the North-Central zone.

In the second stage, healthcare institutions were selected within each state. The selection criteria included institutional level (tertiary or major secondary), evidence of operational health information systems such as electronic medical records or digital reporting platforms, and administrative consent to participate in the study. In each state, one tertiary hospital and at least one secondary healthcare facility were selected to capture variation in service scale, resource availability, and technological capacity. This ensured that both advanced and moderately resourced institutions were represented. The third stage involved the selection of respondents

from the sampled institutions using stratified random sampling. Healthcare professionals were stratified into six categories: doctors, nurses, radiologists, radiographers, medical records officers, and hospital administrators. These categories were selected because of their direct involvement in the generation, interpretation, management, and utilization of health information. Proportionate allocation was applied so that the number of respondents selected from each professional group reflected their relative size within each institution. Sampling frames were obtained from departmental staff registers, and respondents were selected through simple random sampling within each stratum to minimize selection bias.

Two instruments were used for data collection: a semi-structured questionnaire and an in-depth interview guide. The data collection instruments were developed based on the constructs of the Technology Acceptance Model (TAM), particularly perceived usefulness, perceived ease of use, attitude, and intention to use AI systems in health information management. Content validity was established through expert review involving three health information management specialists and three artificial intelligence researchers, who assessed the instruments for clarity, relevance, and alignment with the study objectives. Based on their feedback, minor modifications were made to improve item wording, ensure contextual suitability to Nigeria's healthcare environment, and enhance overall clarity before final administration.

The questionnaire was developed electronically using Google Forms and distributed through professional networks, including WhatsApp, Facebook, LinkedIn, and official hospital communication channels. Data collection occurred between 15 July and 30 September 2025, during which the survey remained active. The study recorded a 98.3% response rate, indicating strong participant engagement and substantially reducing the risk of non-response bias. To further minimise potential bias, follow-up reminders were issued through the same distribution channels, and response trends were monitored to ensure proportional representation across professional categories and healthcare institutions.

The qualitative component employed semi-structured interviews guided by an interview protocol developed from the Technology Acceptance Model (TAM), focusing on participants' experiences with AI applications, perceived benefits, and challenges in health information management. Each interview lasted approximately 40–60 minutes and continued until data saturation was reached, ensuring that no new themes emerged. Interviews were audio-recorded, transcribed verbatim, and analyzed thematically following Braun and Clarke's (2006) six-step procedure, which included familiarization, coding, theme development, and review. To enhance trustworthiness, two independent coders conducted the initial coding, and intercoder reliability was assessed, yielding an agreement rate of 92%, after which discrepancies were resolved through discussion. The qualitative component was introduced to complement and explain quantitative findings, particularly regarding barriers to AI adoption. Sixteen key informants, including doctors, nurses, administrators, and medical records officers, were purposively selected based on their experience with AI applications in healthcare.

Quantitative data were analyzed using the Statistical Package for the Social Sciences (SPSS) Version 20. Descriptive statistics such as frequencies and percentages were used to summarize responses. Qualitative data were analyzed thematically following Braun and Clarke's (2006) approach and integrated with quantitative results to enhance interpretation and validity. Ethical approval was obtained prior to data collection. Participation was voluntary, and respondents were assured of confidentiality, anonymity, and the right to withdraw at any stage. All electronic data were securely stored and accessible only to the researchers throughout the study period.

Results

A total of 393 respondents comprising healthcare professionals and hospital administrative staff successfully participated in the survey.

Knowledge of Artificial Intelligence (AI)

This section explores respondents' understanding of Artificial Intelligence (AI), its applications in healthcare, and their level of exposure to AI-driven technologies. Responses from the 393 healthcare professionals are summarized in Table 1 below:

Table 1: Knowledge and Awareness of AI (N = 393)

Variable	Category	Frequency	Percentage (%)
Familiarity with AI	Very familiar	185	47.1
	Somewhat familiar	142	36.1
	Neutral	50	12.7
	Not familiar at all	16	4.1
Importance of AI in healthcare	Very important	210	53.4
	Important	125	31.8
	Neutral	43	10.9
	Slightly important	12	3.1
	Not important	3	0.8

Source: Field Survey, 2025

The data in Table 1 above indicate that the majority of healthcare professionals (83.2%) are at least somewhat familiar with AI. This shows significant awareness among respondents. Furthermore, over half of the respondents (53.4%) consider AI to be "very important" in healthcare, while an additional 31.8% see it as "important." This demonstrates a strong recognition among professionals that AI has an important role in enhancing healthcare delivery, supporting predictive diagnostics, data management, and decision-making. A small proportion (4.1%) reported no familiarity with AI.

To complement the survey results, in-depth interviews were conducted with selected healthcare professionals across hospitals and other healthcare facilities within Benue State. A Doctor at the Benue State University Teaching Hospital, Makurdi said: "*I use AI-powered imaging tools almost daily. They help me detect subtle anomalies in CT scans that I might miss manually. Without these tools, my decisions would take longer and may not be as precise.*" Doctors actively engage with AI technologies to enhance diagnostic accuracy and efficiency. This testimony shows that AI directly impacts patient care by enabling faster, more precise decision-making.

A Medical Records Officer in one of the public hospitals in Makurdi said that "AI helps in organizing patient records and retrieving information quickly. It reduces the errors we used to make with paper records, and I believe it is essential for modern healthcare management." This stresses AI's value in data management, error reduction, and operational efficiency. The healthcare profession recognises AI as important in healthcare delivery. Interestingly, its adoption is not limited to clinical roles as administrative staff directly benefit from AI-enabled record-keeping, which enhances the overall reliability and timeliness of health information. A nurse however stated that: "I am somewhat familiar with AI. We use some monitoring tools and electronic health records, but training is limited. More awareness is needed for us to fully benefit." The nurse's statement demonstrates that familiarity varies across roles. Although the

majority of respondents are aware of AI, limited training and exposure hinder optimal utilization, especially among nursing staff who interact with patient monitoring systems daily.

Influence of AI on Health Information

This section presents respondents' perceptions on the influence of AI technologies on health information among healthcare professionals in Nigeria.

Table 2: Influence of AI on Health Information (N = 393)

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
AI enhances the accuracy of health information	160 (40.7%)	178 (45.3%)	38 (9.7%)	12 (3.1%)	5 (1.3%)
AI technologies (e.g., X-rays, CT scans, MRIs) enhance medical data interpretation	175 (44.5%)	165 (42.0%)	38 (9.7%)	10 (2.5%)	5 (1.3%)
AI aids in the early detection of diseases and anomalies	145 (36.9%)	178 (45.3%)	45 (11.5%)	18 (4.6%)	7 (1.8%)
AI enhances the organization of health data	150 (38.2%)	170 (43.3%)	43 (10.9%)	20 (5.1%)	10 (2.5%)
AI enables quick retrieval of patient health information	142 (36.1%)	165 (42.0%)	50 (12.7%)	28 (7.1%)	8 (2.0%)
AI supports real-time decision-making for healthcare professionals	140 (35.6%)	175 (44.5%)	50 (12.7%)	20 (5.1%)	8 (2.0%)
AI ensures accurate and reliable health information dissemination	135 (34.3%)	170 (43.3%)	55 (14.0%)	25 (6.4%)	8 (2.0%)
AI enables real-time monitoring and reporting of health data	145 (36.9%)	160 (40.7%)	50 (12.7%)	28 (7.1%)	10 (2.5%)
AI improves epidemic prediction and tracking	130 (33.1%)	158 (40.2%)	60 (15.3%)	35 (8.9%)	10 (2.5%)
AI minimizes errors in medical reporting and documentation	148 (37.7%)	160 (40.7%)	45 (11.5%)	30 (7.6%)	10 (2.5%)
AI optimizes the distribution of medical resources in healthcare settings	140 (35.6%)	150 (38.2%)	60 (15.3%)	35 (8.9%)	8 (2.0%)

Source: Field survey, 2025

The data in Table 2 above show strong positive perceptions regarding AI's role in healthcare information management. A substantial proportion of respondents agreed or strongly agreed across all indicators: accuracy, early disease detection, data organization, real-time monitoring, and resource management. This suggests a favourable assessment of AI's role in healthcare information management. For instance, 86.0% of respondents agreed or strongly agreed that AI enhances the accuracy of health information, while only 4.4% expressed disagreement. Similarly, 86.5% affirmed that AI technologies such as X-rays, CT scans, and MRIs enhance medical data interpretation, with just 3.8% disagreeing. In terms of early disease detection and anomaly identification, 82.2% of respondents expressed agreement, compared to 6.4% who disagreed. Likewise, 81.5% agreed that AI enhances the organization of health data, while 7.6% disagreed. Furthermore, 78.1% of respondents agreed that AI enables quick retrieval of patient health information, compared to 9.1% who disagreed, while 80.1% agreed that AI supports real-time decision-making for healthcare professionals, with 7.1% in disagreement. On the issue of reliable dissemination of health information, 77.6% agreed, while 8.4% disagreed. In addition, 77.6% of respondents agreed that AI enables real-time monitoring and reporting of health data, compared to 9.6% who disagreed. Similarly, 73.3% agreed that AI

improves epidemic prediction and tracking, while 11.4% disagreed. For minimizing errors in medical reporting and documentation, 78.4% expressed agreement, compared to 10.1% who disagreed. Lastly, 73.8% agreed that AI optimizes the distribution of medical resources in healthcare settings, while 10.9% disagreed. By and large, the results indicate that respondents see AI technologies as valuable, reliable, and transformative in improving healthcare information in Nigeria.

To enrich the quantitative findings, healthcare professionals were interviewed to provide contextualized understanding of how AI shapes health information practices. A Radiologist from Benue State University Teaching Hospital stated that: "*AI assists me in quickly identifying anomalies on scans. What used to take hours, sometimes days, is now highlighted by the AI system in minutes, which improves diagnosis accuracy and patient outcomes.*" The radiologist emphasizes time efficiency, accuracy, and reduced human error. A Medical Records Officer from University of Nigeria Teaching Hospital explained that: "*AI flags inconsistencies in patient records automatically. Patient histories are now complete and easily retrievable, especially during emergencies, which was previously a challenge."*

AI has practical efficiency and reliability in record-keeping. It enhances health data organization and retrieval. At the bedside for example, AI impacts clinical decision-making and patient monitoring. A Nurse from Benue State University Teaching Hospital said:

> AI monitoring devices alert me immediately to any vital sign changes. It minimizes human error and allows proactive intervention. However, some systems are complex, requiring proper training to maximize their utility.

This supports survey results for real-time monitoring and decision-making, reflecting both benefits and training needs. Administrators also leverage AI for operational efficiency and resource management. A Hospital Administrator from Federal Medical Centre Keffi commented that "*AI dashboards provide real-time insights on bed occupancy, staff allocation, and supply management. It enables evidence-based planning and prevents bottlenecks before they escalate.*" This correlates with AI's role in optimizing resource distribution and emphasizes system-wide impact beyond clinical care, demonstrating operational improvements.

Challenges and Limitations of AI in Health Information

This section presents the perceived challenges hindering the adoption and effective utilization of AI in health information among healthcare professionals in Nigeria.

Table 3: Challenges and Limitations of AI in Health Information (N = 393)

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
There is a lack of sufficient AI infrastructure in Nigeria's healthcare system	165 (42.0%)	145 (36.9%)	50 (12.7%)	25 (6.4%)	8 (2.0%)
The implementation of AI in healthcare is limited due to cost and resource challenges	150 (38.2%)	160 (40.7%)	45 (11.5%)	30 (7.6%)	8 (2.0%)
Data privacy concerns limit the use of AI in health information management in Nigeria	142 (36.1%)	155 (39.4%)	55 (14.0%)	30 (7.6%)	11 (2.8%)
Poorly organized and incomplete health information limit the effectiveness of AI algorithms	135 (34.3%)	160 (40.7%)	60 (15.3%)	30 (7.6%)	8 (2.0%)
There is shortage of trained professionals skilled in AI technologies	148 (37.7%)	165 (42.0%)	45 (11.5%)	25 (6.4%)	10 (2.5%)

Source: Field survey, 2025

The data in Table 3 indicate that healthcare professionals recognize several significant barriers to effective AI adoption in Nigeria. A large majority of respondents (78.9%) agreed that there is insufficient AI infrastructure in Nigeria's healthcare system, while a similar proportion (78.9%) also agreed that implementation is constrained by cost and resource limitations. Furthermore, 75.5% of respondents agreed that data privacy concerns restrict the use of AI in managing health information, while 75.0% reported that poorly organized and incomplete health records reduce the effectiveness of AI systems. In addition, 79.7% of respondents agreed that there is a shortage of trained professionals with adequate AI skills in the healthcare sector. Across all items, only a relatively small proportion of respondents were neutral (about 11–15%) or disagreed (about 7–10%), suggesting a strong consensus among respondents that systemic, technical, financial, and human capacity constraints significantly hinder the effective integration of AI in Nigeria's healthcare system.

When asked what the most pressing challenges that hinder the adoption of AI in healthcare settings in Nigeria are, some healthcare professionals shared their views. A Doctor from Benue State University Teaching Hospital stated that: "*We have advanced AI software, but the servers often crash due to weak internet. Even when we have the technology, infrastructure bottlenecks reduce its effect.*" Infrastructure limitations remain a major barrier to AI adoption in the Nigerian healthcare sector. Beyond infrastructure, cost and resource allocation are significant concerns. A Hospital Administrator from BSUTH said that: "T*he cost of maintaining AI systems is high. Many hospitals cannot afford the initial setup, software updates, or continuous staff training, which limits our ability to fully deploy AI tools*." Another critical limitation is human capacity and digital skills. A Nurse from Kogi State Specialist Hospital, Lokoja noted that "*Even if AI systems are available, most nurses and support staff are not trained to use them efficiently. We need structured training programmes and hands-on guidance.*" There is a shortage of skilled professionals so capacity-building should be prioritized for effective AI utilization in order to ensure that AI meaningfully enhances healthcare efficiency, accuracy, and decision-making.

Discussion

This study explored the role of AI in health information in Nigeria. The first objective examined knowledge and awareness of AI among healthcare professionals. The findings indicate that AI is no longer an abstract concept in Nigeria's healthcare landscape. Most respondents demonstrated familiarity with AI and its potential applications, suggesting that the idea of machine-assisted diagnostics, predictive analytics, and automated health information management has gained traction. This high level of awareness aligns with studies in other contexts which show that healthcare professionals who are aware of technological innovations are more likely to consider adopting them (Rajpurkar et al., 2022; Alowais et al., 2023). From the perspective of TAM, this awareness reflects a positive attitude (ATT) toward AI, which is critical for forming the intention to use AI technologies (Davis, 1989; Yang et al., 2025). Yet, awareness alone does not guarantee effective use. In practice, professionals, particularly nurses and support staff, often experience gaps in hands-on exposure and structured training. During interviews, several nurses admitted that while AI monitoring systems and electronic health records were available, they lacked sufficient guidance to leverage these tools fully. This emphasizes a critical point: human agency matters. Technology only becomes transformative when individuals are empowered, trained, and confident in its use. Awareness is a necessary starting point, but agency, competence, and motivation shape how AI translates into tangible improvements in healthcare delivery. In TAM terms, the limited hands-on experience reduces perceived ease of use (PEOU), indicating that even with positive attitudes, adoption may be

hindered unless users feel confident in interacting with the technology (Kang et al., 2022; Huang & Lee, 2025).

The second objective focused on the influence of AI on health information. The study reveals that AI is profoundly shaping how healthcare professionals generate, manage, and interpret patient data. Clinicians reported that AI enhances diagnostic accuracy, reduces human error, and enables early detection of anomalies that might otherwise be overlooked. Radiologists highlighted the ability of AI-driven imaging tools to flag subtle findings, dramatically reducing the time between patient presentation and diagnosis. Nurses discussed how real-time monitoring devices alert them to changes in vital signs, enabling proactive interventions rather than reactive responses. Administrative staff, meanwhile, valued AI for streamlining patient records, facilitating quick retrieval, and supporting operational decisions such as bed allocation and resource management. These findings demonstrate that AI's influence is multi-dimensional and role-specific, confirming international observations that the impact of health technologies varies with professional responsibility and context (Rajpurkar et al., 2022; Alowais et al., 2023; Chong et al., 2025). These observations are also consistent with recent evidence showing that AI-enabled clinical systems improve diagnostic performance, workflow efficiency, and patient safety across diverse healthcare settings (Davenport & Kalakota, 2019; Nwoke, 2024).

Through the TAM lens, these findings reflect strong perceived usefulness (PU), as healthcare professionals recognize that AI enhances performance, decision-making, and overall job effectiveness. Importantly, the study underscores that the perceived utility of AI is not merely technical; it has a human dimension. Professionals experience a sense of increased control, confidence, and effectiveness in their work, showing that AI mediates human action rather than replacing it. The technology becomes meaningful through the agency of those who interact with it. This reinforces TAM's assertion that technology adoption is driven by the belief that the system will improve one's work outcomes, which is particularly evident in the context-specific, role-based benefits observed in this study.

The third objective explored challenges and limitations hindering AI adoption. Despite widespread recognition of its value, structural and systemic barriers constrain the full deployment of AI in Nigeria. Respondents emphasized insufficient infrastructure, unreliable internet connectivity, limited access to advanced hardware, and high implementation costs. Human resource constraints were also significant, with many professionals highlighting the lack of adequate training to operate sophisticated AI tools effectively. Data privacy and incomplete health records were cited as ethical and practical obstacles, reflecting concerns over both patient safety and algorithmic reliability (Botha et al., 2024). These challenges echo global evidence that in low- and middle-income countries, technological adoption is often slowed not by the lack of knowledge but by systemic, logistical, and ethical barriers (Olawade, 2024; Dwivedi et al., 2023; Alowais et al., 2023; Aryee et al., 2025). From the narratives gathered, it is clear that while AI has enormous potential, its impact is contingent upon supportive infrastructure, institutional commitment, and continuous capacity-building. Human action is central: professionals can only maximize AI's benefits if they are adequately trained, resourced, and empowered to act within technologically enabled systems. According to TAM, these structural and resource-related barriers negatively affect perceived ease of use (PEOU) and may reduce behavioral intention (IU) to adopt AI, highlighting the need for interventions that simplify system use and strengthen supportive infrastructure (Kang et al., 2022; Al-Nafjan et al., 2025).

The findings across the three research objectives suggest a complex landscape. AI is widely appreciated as a transformative tool in Nigeria's health sector, enhancing accuracy, efficiency, real-time monitoring, early detection, and operational planning. Yet, its effectiveness is not automatic. Professionals' experiences reveal that technology adoption is mediated by human factors, institutional structures, and contextual realities. In other words, AI's promise is realized not solely through its algorithms, but through the people who wield it, the systems that support it, and the policies that govern its use. Theoretically, this confirms TAM's assertion that adoption is a socio-technical process, dependent not only on technology itself but also on perceptions of usefulness and ease of use, as well as attitudes and intentions shaped by contextual and organizational factors.

Conclusion

The study examined perceptions of the integration of AI into the healthcare system among health personnel in Nigeria, with specific objectives of assessing healthcare professionals' knowledge and awareness of AI, examining its perceived influence on health information systems, and identifying the key challenges limiting its effective implementation within healthcare facilities. The findings demonstrate that AI is no longer an abstract or distant innovation within the Nigerian healthcare context. Rather, it is increasingly recognized and engaged with by healthcare professionals. This suggests an emerging epistemic shift in which health personnel are gradually situating AI within the logic of clinical practice, health information management, and institutional efficiency. The study established a consistently strong positive perception of AI's influence on health information systems. AI was found, across quantitative and qualitative evidence, to be widely associated with improved diagnostic accuracy, enhanced interpretation of medical imaging, early disease detection, strengthened real-time clinical decision-making, improved organization and retrieval of patient records, and more efficient health system operations. Importantly, these perceived benefits were not limited to clinical diagnosis alone but extended to administrative and managerial functions, indicating that AI is understood as a cross-cutting tool capable of reshaping both clinical and non-clinical dimensions of health service delivery.

However, despite this favourable perception and recognition of utility, the study also reveals a persistent implementation gap. The integration of AI into Nigeria's healthcare system is significantly constrained by structural, institutional, and capacity-related limitations. These include inadequate digital infrastructure, high financial costs of acquisition and maintenance, shortage of AI-skilled health personnel, concerns around data privacy and security, and the continued prevalence of poorly structured and incomplete health records. Thus the challenge is not primarily attitudinal resistance among healthcare professionals, but rather systemic readiness and institutional capacity to support sustained AI deployment.

The study therefore concludes that the adoption of AI in Nigeria's healthcare system is characterised by a paradox of high perceived value but constrained operational feasibility. While healthcare professionals demonstrate strong cognitive acceptance of AI and recognize its transformative potential, actual integration remains limited by weak infrastructural foundations and insufficient human capital development. The broader implication of these findings is that successful AI integration in Nigeria's healthcare system will require a shift from enthusiasm-based acceptance to systems-based implementation. This entails not only improving digital infrastructure and investing in workforce capacity development, but also strengthening institutional governance frameworks for data management, interoperability, and ethical use of AI in healthcare. Without these enabling conditions, the transformative potential of AI will remain largely under-realised, despite its strong acceptance among end-users.

Strengths and limitations of the Study

This study has several limitations that should be acknowledged. Conceptually, the study focused primarily on healthcare professionals' perspectives, thereby excluding patients, policymakers, and technology developers whose views could have provided a more comprehensive understanding of AI integration. Methodologically, the use of a descriptive survey and self-reported data introduced potential response biases, as participants' opinions may not fully reflect actual practices. Although the mixed-methods design enhanced triangulation, the qualitative component was limited to a small sample of 16 participants, which constrains generalisability. Moreover, all qualitative participants were drawn from urban tertiary hospitals, potentially overlooking the experiences of rural healthcare workers whose challenges with AI adoption, especially in terms of infrastructure, training, and digital literacy may differ significantly.

Also, the study relied on electronic administration of questionnaires through online platforms, potentially excluding professionals in remote or under-connected regions, thus limiting representativeness. The cross-sectional nature of the data also prevents causal inferences about the relationship between AI use and improvements in health information. Specifically, the cross-sectional design captured professionals' perceptions at a single time point (July-September 2025), which may not reflect seasonal variations in AI system performance, recent updates in infrastructure, or evolving training programmes. Longitudinal data would be required to determine whether awareness and perceived usefulness of AI translate into sustained adoption and improved health information practices over time. Despite these limitations, the study provides an important baseline for understanding the state of AI awareness, adoption, and associated challenges in Nigeria's healthcare sector.

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Conflict of Interest:

The authors declare no conflict of interest.

Artificial Intelligence Use:

The authors declare that artificial intelligence tools were used solely for language refinement. The authors take full responsibility for all intellectual content, analysis, interpretations, and conclusions presented in this work.

Authors' contribution:

Esther Anenge Gbaden conceptualized the study and drafted the initial manuscript. Terhile Jude Ahoo contributed to literature review, methodological design, and data interpretation. All authors participated in reviewing, editing, and approving the final version of the manuscript for submission.

Références

Akhtar, Z. B. (2025). Artificial intelligence within medical diagnostics: A multi-disease perspective. *Artificial Intelligence in Health, 2*(3), Article 5173. https://doi.org/10.36922/aih.5173

Ali, O., Abdelbaki, W., Shrestha, A., Elbasi, E., Abdallah Ali Alryalat, M., Dwivedie, Y. K., … & Alryalat, D. (2023). A systematic literature review of artificial intelligence in the healthcare sector: Benefits, challenges, methodologies, and functionalities. *Journal of Innovation & Knowledge, 8*(1), 100333. https://doi.org/10.1016/j.jik.2023.100333

Al-Nafjan, A., Aljuhani, A., Alshebel, A., Alharbi, A., & Alshehri, A. (2025). Artificial intelligence in predictive healthcare: A systematic review. *Journal of Clinical Medicine, 14*(19), Article 6752. https://doi.org/10.3390/jcm14196752

Alowais, S. A., Alghamdi, S. S., Alsuhebany, N., Alqahtani, T., Alshaya, A. I., Almohareb, S. N., Aldairem, A., Alrashed, M., Bin Saleh, K., Badreldin, H. A., Al Yami, M. S., Al Harbi, S., & Albekairy, A. M. (2023). Revolutionizing healthcare: the role of artificial intelligence in clinical practice. *BMC medical education*, *23*(1), 689. https://doi.org/10.1186/s12909-023-04698-z

Ankolekar, A., Eppings, L., Bottari, F., et al. (2024). Using artificial intelligence and predictive modelling to enable learning healthcare systems for pandemic preparedness. *Computational and Structural Biotechnology Journal, 24*, 412–419. https://doi.org/10.1016/j.csbj.2024.05.014

Aryee, J. N. A., Davies, P., Torsah, G. A., Apaw, M. M., Boateng, C. D., Mwando, S. M., … Amekudzi, L. K. (2025). Building capacity for artificial intelligence in Africa: A cross-country survey of challenges and governance pathways. *Artificial Intelligence for Development*, Article 2512.05432. https://doi.org/10.48550/arXiv.2512.05432

Bahadori, S., Buckle, P., Soukup Ascensao, T., Ghafur, S., & Kierkegaard, P. (2025). Evolving digital health technologies: Aligning with and enhancing the evidence standards framework for AI and digital health. *JMIR mHealth and uHealth, 13*, Article e67435. https://doi.org/10.2196/67435

Barker, D. et al. (2023). Artificial intelligence in healthcare institutions: A systematic literature review on influencing factors. *Technology in Society, 76*, 102443. https://doi.org/10.1016/j.techsoc.2023.102443

Botha, N. N., Segbedzi, C. E., Dumahasi, V. K., & colleagues. (2024). Artificial intelligence in healthcare: A scoping review of perceived threats to patient rights and safety. *Archives of Public Health, 82*, 188. https://doi.org/10.1186/s13690-024-01414-1

Chong, P. L., & colleagues. (2025). Integrating artificial intelligence in healthcare: Applications, diagnostic advances, and personalized treatment planning. *Journal of Healthcare Informatics and Practice*. https://pubmed.ncbi.nlm.nih.gov/40616302/

Davenport, T., & Kalakota, R. (2019). The potential for artificial intelligence in healthcare. *Future Healthcare Journal, 6*(2), 94–98. https://doi.org/10.7861/fhj.2019-0017

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340. https://doi.org/10.2307/249008

Dwivedi, Y. K., Kshetri, N., Hughes, L., Slade, E. L., Jeyaraj, A., Kar, A. K., … Wright, R. (2023). So what if ChatGPT wrote it? Multidisciplinary perspectives on opportunities, challenges and implications of generative artificial intelligence for research, practice and policy. *International Journal of Information Management, 71*, 102642. https://doi.org/10.1016/j.ijinfomgt.2023.102642

Federal Ministry of Health. (2021). *National digital health strategic framework (2020–2024)*. Federal Ministry of Health, Nigeria.

Fernandes Prabhu, D. (2025). Integrating artificial intelligence in electronic health records for predictive modelling and diagnostics. *Healthcare, 13*(21), Article 2753. https://doi.org/10.3390/healthcare13212753

Fetters, M. D., & Tajima, C. (2022). Joint displays of integrated data collection in mixed methods research. *International Journal of Qualitative Methods, 21*, 1–13. https://doi.org/10.1177/16094069221104564

Hakkim, H. E., et al. (2024). Advances in artificial intelligence and machine learning applications in healthcare. *AI*, *5*(4), Article 95. https://doi.org/10.3390/ai5040095

Huang, J. W. Y., & Lee, M. J. (2025). Technology Acceptance Model in medical education: Systematic review of constructs influencing acceptance and use. *JMIR Medical Education, 6*, Article e67873. https://doi.org/10.2196/67873

Ibrahim, F., Münscher, J.-C., Daseking, M., & Telle, N.-T. (2025). The technology acceptance model and adopter type analysis in the context of artificial intelligence. *Frontiers in Artificial Intelligence, 7*, Article 1496518. https://doi.org/10.3389/frai.2024.1496518

Karami, M. (2025). Artificial intelligence and digital health in primary health care: Challenges and policy insights for LMICs. *Frontiers in Digital Health, 2*, Article 1532361. https://doi.org/10.3389/fdgth.2025.1532361

Kruse, C. S., Stein, A., Thomas, H., & Kaur, H. (2018). The use of electronic health records to support population health: A systematic review of the literature. *Journal of Medical Systems, 42*(11), 214. https://doi.org/10.1007/s10916-018-1075-6

Mienye, I. D., Sun, Y., & Ileberi, E. (2024). *Artificial intelligence and sustainable development in Africa: A comprehensive review*. *Machine Learning with Applications, 7*, Article 100591. https://doi.org/10.1016/j.mlwa.2024.100591

Mohajer-Bastami, A., et al. (2025). Artificial intelligence in healthcare: A narrative review of applications, challenges, and future directions. *Frontiers in Digital Health*. https://doi.org/10.3389/fdgth.2025.1644041

Nwoke, J. (2024). Healthcare data analytics and predictive modelling: Enhancing outcomes in resource allocation and disease forecasting. *International Journal of Health Sciences*. https://doi.org/10.47941/ijhs.2245

Okwukwu, M., Olofin, D. O., & Akintayo Taiwo, A. (2025). Artificial intelligence in Nigeria healthcare: A review of state, challenges and opportunities. *EthAIca, 4*, 210. https://doi.org/10.56294/ai2025210

Olawade, D. B. (2024). *Artificial intelligence in healthcare delivery: Prospects, challenges, and ethical considerations*. *Computer Methods and Programs in Biomedicine Update*. https://doi.org/10.1016/j.cmpbup.2024.100158

Rajpurkar, P., Chen, E., Banerjee, O., & Topol, E. J. (2022). AI in health and medicine. *Nature medicine*, *28*(1), 31–38. https://doi.org/10.1038/s41591-021-01614-0

Topol, E. J. (2019). *Deep medicine: How artificial intelligence can make healthcare human again*. Basic Books.

Tshimula, J. M., Kalengayi, M., Makenga, D., Lilonge, D., Asumani, M., Muabila, J. T., … Mpinga, E. K. (2024). Artificial intelligence for public health surveillance in Africa: Applications and opportunities. *Preprint*. https://arxiv.org/abs/2408.02575

World Health Organization. (2021). *Global strategy on digital health 2020–2025*. World Health Organization. https://www.who.int/publications/i/item/9789240020924Bottom of Form

Yang, H. J., Lee, J.-H., & Lee, W. (2025). Factors influencing health care technology acceptance in older adults based on TAM and UTAUT: Meta-analysis. *Journal of Medical Internet Research, 27*(1), e65269. https://doi.org/10.2196/65269