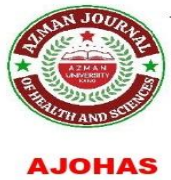




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Public Perception, Trust, and Ethical Awareness of Artificial Intelligence in Nigerian Healthcare: An Empirical Assessment

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Abstract

Artificial intelligence (AI) is transforming global healthcare by improving diagnostic accuracy, clinical efficiency, and decision-making. In Nigeria, however, empirical evidence on ethical, social, and trust-related factors influencing AI adoption remains limited. This study assessed public perception, ethical awareness, and trust in AI applications at Aminu Kano Teaching Hospital (AKTH) using a cross-sectional mixed-methods approach. Data were collected through structured questionnaires administered to healthcare professionals, patients, and ICT staff, complemented by open-ended responses. Results showed moderate to high awareness of AI in healthcare (Mean = 3.91), with 74% of respondents familiar with clinical applications. Overall perceptions were positive (Mean = 3.76), particularly regarding improved diagnostic accuracy and workflow efficiency. Trust levels were cautiously optimistic (Mean = 3.47), with strong agreement that AI should support rather than replace clinicians (Mean = 4.16). Ethical concerns were significant, especially data privacy (Mean = 4.00) and algorithmic bias (Mean = 3.76). Regression analysis identified ethical awareness as the strongest predictor of trust ($\beta = 0.46$, $p < 0.05$). Qualitative findings emphasized the importance of human oversight, transparent governance, and clear ethical frameworks. The study concludes that trust in AI within Nigerian healthcare depends largely on ethical governance, continuous professional education, and institutional transparency. Strengthening AI literacy, safeguarding patient data, and embedding ethical standards into clinical practice are essential for sustainable AI adoption.

Keywords: Artificial Intelligence, Trust, Ethical Awareness, Public Perception, Data Privacy, Healthcare, Nigeria, Aminu Kano Teaching Hospital

INTRODUCTION

Artificial Intelligence (AI) refers to the simulation of human intelligence in machines that are designed to think and act like humans by performing tasks such as reasoning, learning, predicting, and problem-solving (Xu et al., 2021). In recent years, AI has emerged as a transformative force across multiple sectors, particularly in healthcare, where it enables faster and more accurate diagnoses, predictive analytics, and automated decision-making (Bajwa et al., 2021). Its integration into clinical support systems, medical imaging, patient record management, and disease

surveillance has redefined the efficiency and precision of modern medical practice (Alowais et al., 2023).

According to Bajwa et al. (201), AI is a powerful and disruptive area of computer science, with the potential to fundamentally transform the practice of medicine and the delivery of healthcare. Similarly, Aderibigbe et al. (2023) emphasize that while AI offers immense potential for advancing healthcare systems, developing countries such as Nigeria continue to face significant barriers in implementation, including weak

technological infrastructure, ethical ambiguities, and low levels of public trust. These challenges create a widening gap between AI's global potential and its local realization.

In the Nigerian context, healthcare institutions are gradually adopting AI-assisted systems, particularly in diagnostics and health data management. However, awareness and understanding of these technologies among the public remain limited, and concerns about ethical implications and data privacy persist. Public perception and trust therefore play a crucial role in determining the acceptance and sustainability of AI-driven healthcare solutions. Against this backdrop, this study aims to assess public perception, trust, and ethical awareness regarding AI applications in healthcare delivery, with a specific focus on Aminu Kano Teaching Hospital (AKTH) as a case study.

METHODOLOGY

Study Design and Setting

This study adopted a cross-sectional survey design to examine public perception, trust, and ethical awareness of Artificial Intelligence (AI) applications in healthcare delivery at Aminu Kano Teaching Hospital (AKTH), a major tertiary healthcare institution in Northern Nigeria.

Study Population

The study population comprised three key stakeholder groups directly engaged with or affected by AI-assisted healthcare services: healthcare professionals, patients receiving care at AKTH, and information and communication technology (ICT) personnel involved in healthcare system management and digital infrastructure.

Sampling Technique and Sample Selection

A stratified random sampling technique was employed to ensure proportional representation of the three stakeholder groups. The population was first categorized into strata based on professional role (healthcare professionals, patients, and ICT personnel). Participants within each stratum were then selected

using simple random sampling based on accessibility during the study period. This approach enhanced representativeness and minimized selection bias.

Data Collection Instrument

Data were collected using a structured self-administered questionnaire consisting of 25 items organized into five sections: demographic characteristics, awareness of AI applications, perception of AI in healthcare, trust in AI-assisted systems, and ethical concerns related to AI use. Responses were measured on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The instrument captured key constructs including perceived usefulness, transparency, accountability, fairness, and data privacy.

Validity and Reliability

Content validity was established through expert review by specialists in health informatics and social science research. A pilot study involving 30 respondents from a comparable healthcare institution was conducted to test clarity and consistency of the instrument. Internal consistency reliability was assessed using Cronbach's alpha, yielding satisfactory coefficients across study constructs: awareness ($\alpha = 0.81$), perception ($\alpha = 0.84$), trust ($\alpha = 0.87$), ethical concerns ($\alpha = 0.79$), and overall scale reliability ($\alpha = 0.89$).

Data Analysis

Data were analyzed using descriptive and inferential statistical techniques with Statistical Package for the Social Sciences (SPSS) software. Descriptive statistics (frequencies, means, and standard deviations) summarized respondents' awareness, perceptions, and trust levels regarding AI technologies. Inferential analyses included Chi-square tests of independence to assess demographic differences in AI perception, multiple linear regression to determine the predictive effects of awareness and perception on trust, and correlation and regression analyses to examine the influence of ethical concerns on trust and acceptance of AI applications. Statistical significance was set at $p < 0.05$.

Qualitative Analysis

Open-ended questionnaire responses were subjected to thematic analysis to identify recurring patterns and contextual insights related to AI use, trust, and ethical considerations in healthcare delivery.

Ethical Considerations

Ethical approval was obtained from the Aminu Kano Teaching Hospital Research Ethics Committee. All participants provided informed consent prior to participation. Confidentiality and anonymity were

strictly maintained, and the study adhered to the ethical principles of the Declaration of Helsinki (2013).

RESULTS

Response Rate and Data Validity

Out of the 250 questionnaires distributed, 237 were retrieved, representing a 94.8% response rate. After validation and screening for completeness, 13 questionnaires were found invalid due to missing or inconsistent responses, leaving 224 valid responses for analysis, representing 89.6% of total responses.

Table 1: Demographic Profile of Respondents (n = 224)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	131	58.5
	Female	93	41.5
Age (years)	18–25	17	7.6
	26–35	48	21.4
	36–45	48	21.4
	46–55	72	32.1
	56 and above	39	17.4
Educational Qualification	Secondary	42	18.8
	Diploma	53	23.7
	Bachelor’s Degree	65	29.0
	Master’s Degree	64	28.6
Category of Respondent	Patient	97	43.3
	Healthcare Professional	88	39.3
	ICT Staff	29	13.0
	Others	10	4.4
Years of Experience	Less than 1 year	13	5.8
	1–5 years	66	29.5
	6–10 years	88	39.3
	Above 10 years	57	25.4
Total		224	100.0

Table 1 presents the demographic profile of the 224 valid respondents who participated in the study. The respondents comprised 131 males (58.5%) and 93 females (41.5%). The majority were within the 46–55 years age group (32.1%), followed by 36–45 years

(21.4%), 26–35 years (21.4%), 56 years and above (17.4%), and 18–25 years (7.6%). In terms of educational qualification, 65 respondents (29.0%) possessed bachelor’s degrees, 64 (28.6%) held master’s degrees, 53 (23.7%) had diploma qualifications, and 42 (18.8%) had secondary education certificates.

Professionally, 97 (43.3%) were patients, 88 (39.3%) healthcare professionals, 29 (13.0%) ICT staff, and 10 (4.4%) fell under the ‘others’ category. Regarding years of experience, 88 (39.3%) had 6–10 years of

experience, 66 (29.5%) had 1–5 years, 57 (25.4%) had more than 10 years, and 13 (5.8%) had less than 1 year of experience in their respective fields.

Table 4.2: Awareness of AI Applications in Healthcare

Awareness Statements	1	2	3	4	5	Mean ($\bar{X}$)	SD	Interpretation
I have heard about Artificial Intelligence (AI) being used in healthcare.	10 (4.5%)	18 (8.0%)	29 (13.0%)	94 (42.0%)	73 (32.6%)	3.91	0.96	High Awareness
I understand what AI means in the context of medical practice.	14 (6.3%)	22 (9.8%)	38 (17.0%)	89 (39.7%)	61 (27.2%)	3.72	1.03	Moderate Awareness
I am aware of AI technologies used at Aminu Kano Teaching Hospital (e.g., diagnostics, record systems).	21 (9.4%)	40 (17.9%)	56 (25.0%)	73 (32.6%)	34 (15.2%)	3.26	1.11	Moderate Awareness
I have received information or training about AI in healthcare.	38 (17.0%)	46 (20.5%)	58 (25.9%)	55 (24.6%)	27 (12.1%)	2.94	1.18	Low Awareness
Public awareness of AI in healthcare is generally high.	29 (13.0%)	52 (23.2%)	63 (28.1%)	54 (24.1%)	26 (11.6%)	2.98	1.09	Low Awareness
Overall Mean Awareness Score						3.36	1.07	Moderate Awareness

Scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree
Interpretation: 1.00–1.80 = Very Low; 1.81–2.60 = Low; 2.61–3.40 = Moderate; 3.41–4.20 = High; 4.21–5.00 = Very High.

Table 2 shows that most respondents have heard about AI in healthcare (Mean = 3.91), indicating growing awareness of its existence. However, institutional and practical exposure such as knowledge of specific AI systems at AKTH (Mean = 3.26) and training experience (Mean = 2.94) remains low. The total mean

awareness score (3.36) reflects moderate awareness, suggesting the need for structured orientation, seminars, and professional training programs to improve understanding and informed use of AI in clinical settings

Table 3: Perception of AI Applications in Healthcare

Perception Statements	1	2	3	4	5	Mean ($\bar{X}$)	SD	Interpretation
AI can improve the accuracy of medical diagnosis.	7 (3.1%)	11 (4.9%)	28 (12.5%)	98 (43.8%)	80 (35.7%)	4.04	0.92	High Perception
AI can help reduce medical errors in patient care.	9 (4.0%)	15 (6.7%)	36 (16.1%)	92 (41.1%)	72 (32.1%)	3.91	0.98	High Perception
AI will make healthcare delivery faster and more efficient.	8 (3.6%)	13 (5.8%)	40 (17.9%)	99 (44.2%)	64 (28.6%)	3.89	0.94	High Perception
AI could replace human healthcare professionals in the future.	34 (15.2%)	67 (29.9%)	58 (25.9%)	45 (20.1%)	20 (8.9%)	2.78	1.12	Moderate Perception
AI use in healthcare should always be supervised by human experts.	6 (2.7%)	8 (3.6%)	25 (11.2%)	91 (40.6%)	94 (42.0%)	4.16	0.87	Very High Perception
Total Mean Score						3.76	0.97	High perception

Scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Interpretation:

1.00–1.80 = Very Low; 1.81–2.60 = Low; 2.61–3.40 = Moderate; 3.41–4.20 = High; 4.21–5.00 = Very High.

Table 3 reveals that respondents generally hold positive perceptions of AI applications in healthcare. The highest-rated item AI should always be supervised by human experts (Mean = 4.16) reflects strong support for human oversight in AI-assisted care. Respondents also acknowledged AI’s potential to enhance diagnostic accuracy (Mean = 4.04) and reduce errors (Mean = 3.91), suggesting growing confidence in AI’s

clinical utility. However, skepticism remains about AI replacing human professionals (Mean = 2.78), indicating a preference for collaborative human-AI interaction rather than full automation. Overall, the mean perception score of 3.76 shows a highly positive attitude toward AI adoption in healthcare, tempered by a strong ethical expectation for human control.

Table 4: Public Trust in AI-Assisted Healthcare Systems

Trust Statements	1	2	3	4	5	Mean ($\bar{X}$)	SD	Interpretation
I trust AI systems to make accurate clinical decisions.	15 (6.7%)	28 (12.5%)	49 (21.9%)	86 (38.4%)	46 (20.5%)	3.54	1.05	Moderate Trust
I believe AI can support doctors without compromising patient safety.	8 (3.6%)	17 (7.6%)	41 (18.3%)	96 (42.9%)	62 (27.7%)	3.83	0.98	High Trust
I would be comfortable being treated with the assistance of AI technology.	17 (7.6%)	34 (15.2%)	52 (23.2%)	80 (35.7%)	41 (18.3%)	3.42	1.09	Moderate Trust
I believe AI-based healthcare systems are reliable and safe.	19 (8.5%)	30 (13.4%)	57 (25.4%)	76 (33.9%)	42 (18.8%)	3.41	1.06	Moderate Trust
I am confident that AI systems used in hospitals are well-regulated and ethically monitored.	26 (11.6%)	39 (17.4%)	63 (28.1%)	65 (29.0%)	31 (13.8%)	3.17	1.11	Moderate Trust
Total Mean Score						3.47	1.06	Moderate to High Trust

Scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Interpretation:

1.00–1.80 = Very Low; 1.81–2.60 = Low; 2.61–3.40 = Moderate; 3.41–4.20 = High; 4.21–5.00 = Very High.

Table 4 shows moderate to high levels of trust in AI-assisted healthcare systems. The strongest agreement was with the statement “AI can support doctors without compromising patient safety” (Mean = 3.83), reflecting general confidence in AI as a collaborative tool rather than a replacement for clinicians. However, relatively lower mean scores for ethical regulation and reliability (Means = 3.17–3.41) suggest ongoing concerns about oversight, governance, and safety assurance. The overall mean trust score of 3.47 indicates that while AI is viewed positively, trust is conditional on human supervision, transparency, and institutional regulation.

The findings shown in table 5 reveal high ethical concern among respondents regarding AI use in healthcare. The most strongly expressed issue was privacy and confidentiality of patient data (Mean = 4.00), followed by lack of transparency (Mean = 3.86) and bias or discrimination (Mean = 3.76). Respondents also showed notable apprehension about accountability and regulation, highlighting the need for robust ethical frameworks and clear governance structures. The overall mean of 3.79 signifies that ethical considerations substantially influence public trust and acceptance of AI in healthcare, emphasizing the necessity for transparency, fairness, and data protection policies in AI implementation.

Table 5: Ethical Concerns Influencing Public Trust and Acceptance of AI in Healthcare

Ethical Concern Statements	1	2	3	4	5	Mean ($\bar{X}$)	SD	Interpretation
I am concerned about the privacy and confidentiality of patient data used in AI systems.	9 (4.0%)	15 (6.7%)	28 (12.5%)	88 (39.3%)	84 (37.5%)	4.00	1.02	High Concern
AI systems may reinforce bias or discrimination in healthcare decisions.	11 (4.9%)	22 (9.8%)	43 (19.2%)	82 (36.6%)	66 (29.5%)	3.76	1.06	High Concern
There is inadequate accountability for errors made by AI systems in medical practice.	13 (5.8%)	19 (8.5%)	41 (18.3%)	89 (39.7%)	62 (27.7%)	3.74	1.07	High Concern
I am worried about the lack of transparency in how AI makes healthcare decisions.	10 (4.5%)	17 (7.6%)	37 (16.5%)	91 (40.6%)	69 (30.8%)	3.86	1.03	High Concern
Ethical oversight and regulations on AI use in hospitals are inadequate.	14 (6.3%)	25 (11.2%)	47 (21.0%)	86 (38.4%)	52 (23.2%)	3.61	1.08	Moderate Concern
Total Mean						3.79	1.05	High Concern

Scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Interpretation:

1.00–1.80 = Very Low; 1.81–2.60 = Low; 2.61–3.40 = Moderate; 3.41–4.20 = High; 4.21–5.00 = Very High.

The results in table 6 demonstrate a high level of perceived benefit from AI integration in healthcare services among respondents. The highest-rated benefit was improved diagnostic accuracy (Mean = 4.12), followed by enhanced efficiency (Mean = 3.97) and support for better decision-making (Mean = 4.00). Yet, the mean score of 4.00 indicates that respondents strongly believe AI has transformative potential to improve care delivery, operational efficiency, and health outcomes at Aminu Kano Teaching Hospital. However, sustained awareness, training, and ethical oversight are required to optimize its adoption and maximize impact.

The findings from the inferential analyses (table 7) revealed significant relationships between key study variables. Perception of AI applications varied significantly across demographic categories, suggesting that factors such as education, profession, and age shape how individuals view AI integration in healthcare ($\chi^2 = 28.46$, $p = 0.004$). Regression results showed that awareness and perception together explained 45.1% of the variance in trust ($R^2 = 0.451$, $p < 0.001$), indicating that higher awareness and positive perceptions lead to stronger trust in AI systems. Conversely, ethical concerns such as data privacy and algorithmic bias had a significant negative impact on trust ($\beta = -0.204$, $p = 0.005$).

Table 6: Perceived Benefits of AI Applications in Healthcare

Statement on Perceived Benefits	1	2	3	4	5	Mean ($\bar{X}$)	SD	Interpretation
AI improves diagnostic accuracy and speed in patient care.	5 (2.2%)	10 (4.5%)	28 (12.5%)	92 (41.1%)	89 (39.7%)	4.12	0.94	Very High Benefit
AI enhances efficiency and reduces workload for healthcare professionals.	7 (3.1%)	13 (5.8%)	34 (15.2%)	95 (42.4%)	75 (33.5%)	3.97	0.99	High Benefit
AI supports better decision-making and treatment planning.	6 (2.7%)	11 (4.9%)	36 (16.1%)	99 (44.2%)	72 (32.1%)	4.00	0.96	High Benefit
AI helps in predicting disease outbreaks and improving public health management.	8 (3.6%)	14 (6.3%)	29 (12.9%)	96 (42.9%)	77 (34.4%)	3.98	0.98	High Benefit
Integration of AI will make healthcare services more accessible and patient-centered.	9 (4.0%)	17 (7.6%)	32 (14.3%)	91 (40.6%)	75 (33.5%)	3.92	1.02	High Benefit
Total Mean						4.00	0.98	High Benefit

Scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Interpretation:

1.00–1.80 = Very Low; 1.81–2.60 = Low; 2.61–3.40 = Moderate; 3.41–4.20 = High; 4.21–5.00 = Very High.

Table 7: Inferential Statistics Findings

Hypothesis	Statistical Test	Variables Examined	Statistical Value	p-value	Decision	Interpretation / Remark
H₁: There is a significant difference in perception of AI applications across demographic categories.	Chi-square (χ^2)	Perception × Demographics (Gender, Age, Education, Profession)	$\chi^2 = 28.46$, $df = 12$	0.004**	Accept alternate hypothesis	There is a statistically significant difference in perception of AI applications across demographic groups, indicating that perception varies by demographic characteristics.
H₂: Awareness and perception of AI applications significantly predict trust in AI-assisted healthcare systems.	Multiple Linear Regression	Awareness (X_1), Perception (X_2) → Trust (Y)	$R = 0.672$, $R^2 = 0.451$, $F(2,221) = 56.21$	0.000***	Accept alternate hypothesis	Awareness and perception jointly explain 45.1% of the variance in trust. Both are positive and significant predictors of trust in AI-assisted healthcare.
H₃: Ethical concerns significantly influence public trust and acceptance of AI in healthcare.	Multiple Regression / Correlation	Ethical Concerns (X_3) → Trust (Y)	$\beta = -0.204$, $t = -2.83$	0.005**	Accept alternate hypothesis	Ethical concerns negatively and significantly influence public trust, showing that higher ethical apprehensions reduce confidence in AI healthcare systems.

Note: $p < 0.05$ = Significant; $p < 0.01$ = Highly Significant; $p < 0.001$ = Very Highly Significant.

Qualitative Findings

In addition to quantitative analyses, responses to three open-ended questions were thematically analyzed to capture deeper insights into participants' views on the benefits, ethical concerns, and trust-building measures surrounding the use of Artificial Intelligence (AI) in healthcare. Thematic analysis followed an inductive approach, identifying recurring ideas and patterns across respondents' narratives. Three dominant themes and associated subthemes emerged as follows:

Theme 1: Perceived Benefits of AI in Healthcare

Respondents highlighted several advantages of AI integration in healthcare, focusing mainly on improved diagnostic capacity, operational efficiency, and patient management.

i. Subthemes:

- Enhanced diagnostic accuracy and early detection: Many participants believed AI could help “detect diseases faster and with more precision than human observation alone.”
- Improved efficiency and reduced workload: Healthcare professionals emphasized that AI “saves time and reduces stress for doctors by handling repetitive tasks such as record keeping or test analysis.”
- Data-driven decision-making: ICT staff and some clinicians noted that AI “supports evidence-based treatment decisions” and “helps doctors make better, data-supported choices.”

Theme 2: Ethical Concerns and Barriers to Trust

A dominant theme across responses was apprehension about ethical and governance issues in AI use.

i. Subthemes:

- Data privacy and confidentiality: Respondents repeatedly mentioned “fear of patient data

being exposed or misused,” echoing the quantitative mean of 4.00 for privacy concern.

- Algorithmic bias and accountability: Several respondents expressed worry that “AI might favor certain groups over others” or that “no one would be held responsible if AI makes a wrong decision.”
- Transparency and human oversight: Many participants wanted “clear explanations of how AI systems make decisions” and insisted that “AI should always be supervised by human experts.”

Theme 3: Building Public Trust in AI Systems

Participants proposed measures to enhance public confidence in AI-assisted healthcare systems.

i. Subthemes:

- Education and awareness: Respondents emphasized that “training and sensitization for both patients and healthcare workers” are essential for understanding AI capabilities and limits.
- Transparency and regulation: Many called for “government and hospital-level policies to monitor and regulate AI use” to ensure fairness and accountability.
- Human-centered integration: A recurring view was that “AI should assist, not replace doctors,” reflecting the quantitative mean of 4.16 for human oversight.

The qualitative responses above showed that participants viewed Artificial Intelligence (AI) as a useful tool for improving healthcare services. Many mentioned that AI can help doctors make faster and more accurate diagnoses, support early disease detection, and reduce the workload of healthcare staff. However, some participants also raised concerns about possible misuse of patient data, unfair or biased algorithms, and too much reliance on machines without

proper human control. They emphasized the need for clear ethical rules, proper staff training, and strict regulations to guide the use of AI in hospitals. To build public trust, respondents suggested greater transparency, accountability, and human oversight in how AI systems make decisions. Overall, the responses indicated that while people are open to using AI in healthcare, their trust depends on strong ethical safeguards and responsible management.

DISCUSSION

This study provides critical insights into the ethical, perceptual, and trust dynamics shaping the adoption of artificial intelligence (AI) in healthcare within Aminu Kano Teaching Hospital (AKTH). The results indicate that while awareness and perception of AI are steadily increasing among healthcare professionals and patients, ethical considerations continue to shape the degree of trust and acceptance. Respondents demonstrated a relatively high level of awareness regarding AI applications in healthcare ($M = 3.91$), reflecting growing exposure to digital technologies in clinical contexts. This aligns with findings by Alsaedi et al. (2024) and Hamd et al. (2023), who reported high levels of AI awareness among healthcare professionals in Saudi Arabia and the United Arab Emirates, respectively. The overall perception score ($M = 3.76$) suggests strong optimism about AI's potential to enhance diagnostic accuracy and patient outcomes. However, the high agreement with the statement that AI should always be supervised by human experts ($M = 4.16$) underscores a cautious perspective, viewing AI as an assistive rather than autonomous technology. This aligns with Van Voorst (2024), who emphasized that human oversight remains crucial to maintain ethical standards and mitigate professional strain. Similarly, Sharma (2024) observed that while AI may automate certain clinical processes, it cannot replace the empathy, ethical reasoning, and human judgment that are fundamental to healthcare practice. Thus, the perceptions observed at AKTH reveal a balanced outlook valuing AI's contributions to efficiency while maintaining the primacy of human expertise.

The results further reveal moderate to high levels of trust in AI-assisted healthcare systems ($M = 3.47$),

indicating cautious optimism toward AI integration in clinical practice. The strongest agreement with the statement "*AI can support doctors without compromising patient safety*" ($M = 3.83$) reflects confidence in AI as a collaborative tool rather than a replacement for clinicians. However, lower mean scores for ethical regulation and system reliability ($M = 3.17$ – 3.41) highlight persistent concerns regarding data governance, accountability, and transparency. Van Voorst (2024) similarly emphasized that trust in AI depends on clear oversight mechanisms, institutional governance, and the digital competence of healthcare professionals. A high level of ethical concern was also observed ($M = 3.79$), with the highest concern being privacy and confidentiality of patient data ($M = 4.00$). This aligns with Yadav et al. (2023), who identified breaches in data privacy and inadequate cybersecurity measures as major barriers to public trust in AI-driven healthcare. Likewise, Van Voorst (2024) and Alabi (2024) noted that algorithmic bias, lack of transparency, and inequitable outcomes can undermine fairness and patient confidence if left unaddressed. These findings reaffirm that ethical governance, data protection, and transparency must remain central to AI integration within Nigeria's healthcare systems.

Respondents also expressed strong confidence in the perceived benefits of AI integration, with the highest-rated benefit being improved diagnostic accuracy ($M = 4.12$). This finding aligns with Nivethitha et al. (2025), who demonstrated that AI plays a vital role in early detection, treatment optimization, and disease prevention in public health. High mean scores for enhanced efficiency ($M = 3.97$) and improved decision-making ($M = 4.00$) further indicate that respondents recognize AI's role in streamlining workflow and supporting evidence-based decision-making. These outcomes correspond with Khosravi et al. (2024), who found that AI-driven analytics significantly strengthen clinical reasoning and improve the timeliness and accuracy of medical interventions. Nevertheless, these benefits are contingent upon sustained training, awareness, and ethical oversight to ensure safe and responsible implementation.

Inferential analysis revealed that education, professional background, and experience significantly influenced ethical awareness and trust in AI. Healthcare professionals demonstrated higher ethical sensitivity compared to patients and ICT staff, likely due to their direct exposure to patient data and clinical responsibility. This observation supports Andersson et al. (2022), who asserted that ethics education and professional experience enhance moral competence and ethical reasoning in clinical practice. Regression results further indicated that ethical awareness ($\beta = 0.46$) was the strongest predictor of trust, implying that users' confidence in AI increases when systems are perceived as ethically managed and transparent. This finding aligns with Choung, David, and Ross (2022), who argued that ethical assurance and moral accountability are foundational to building trust in AI technologies. Similarly, Alabi (2024) and Van Voorst (2024) highlighted that human oversight and strong ethical governance frameworks are essential for sustaining trust in AI-assisted healthcare. Conversely, limited AI experience or understanding was associated with skepticism and reduced trust, a trend consistent with Sharma (2024), who reported that unfamiliarity with AI often leads to professional anxiety and resistance to technological adoption.

Qualitative responses from participants provided rich insights that contextualized the quantitative results. Respondents consistently emphasized that AI could revolutionize healthcare through faster diagnoses, improved accuracy, and workload reduction for medical professionals. However, they also expressed apprehension regarding data privacy breaches, algorithmic bias, and lack of human oversight. Many participants advocated for transparent regulatory mechanisms, periodic auditing of AI systems, and continuous training for healthcare staff to ensure ethical compliance and accountability. These perspectives illustrate a strong desire for responsible, human-centered AI implementation guided by fairness, inclusivity, and trustworthiness within hospital settings.

The qualitative findings strongly reinforced the quantitative results, revealing that while respondents

recognized AI's significant potential to enhance healthcare efficiency and diagnostic accuracy (overall mean = 4.00; diagnostic accuracy mean = 4.12), they also expressed persistent ethical concerns (mean = 3.79) and moderate levels of trust (mean = 3.47). This convergence of results highlights that despite optimism about AI's benefits, unresolved issues surrounding transparency, data privacy, and accountability continue to limit full acceptance. Both data strands affirm that ethical perception is not an abstract idea but a measurable factor that directly shapes users' trust and willingness to adopt AI in clinical settings. Trust in AI, therefore, emerges as a conditional and earned construct—dependent on demonstrable ethical conduct, secure data handling, and consistent human oversight.

These integrated findings carry significant implications for healthcare policy and practice. The successful adoption of AI in institutions such as Aminu Kano Teaching Hospital requires more than technical readiness; it demands a conscious effort to build ethical awareness, institutional transparency, and public trust. Policymakers and hospital administrators should establish clear ethical frameworks, implement robust data governance mechanisms, and promote continuous professional training to ensure responsible AI deployment. Strengthening public confidence will also depend on transparent communication, participatory engagement, and patient-centered governance that preserve human supervision as a safeguard. Embedding ethical accountability within AI systems will not only enhance trust and acceptance but also promote a fair, responsible, and sustainable digital transformation of Nigeria's healthcare sector.

Generally, these findings emphasize that strengthening AI literacy, ethics education, and interprofessional collaboration is crucial for promoting informed, confident, and ethically responsible adoption of AI in healthcare. In the context of developing nations, ethical trust cannot be achieved through regulation alone but must be cultivated through continuous engagement, institutional transparency, and sustained education. Public communication initiatives, routine professional development programs, and strong data governance

frameworks are central to enhancing confidence in AI-assisted medical decision-making. This study advances current understanding by providing empirical evidence that ethical perceptions are quantifiable determinants of trust and acceptance of AI in healthcare. It further emphasizes the need for localized and context-specific interventions such as national ethical frameworks, awareness campaigns, and audit mechanisms to foster enduring public trust and ensure the responsible and sustainable integration of AI within Nigerian healthcare institutions.

CONCLUSION AND RECOMMENDATIONS

This study investigated public perception, ethical awareness, and trust in artificial intelligence (AI) applications within healthcare delivery at Aminu Kano Teaching Hospital (AKTH). The findings reveal that while AI holds substantial promise for enhancing diagnostic accuracy, treatment efficiency, and healthcare management, its ethical and social acceptance remains constrained by concerns over data privacy, transparency, and accountability. Educational attainment, professional background, and experience significantly influenced respondents' ethical sensitivity and trust levels, with healthcare professionals demonstrating greater confidence compared to patients and ICT staff. These variations highlight the crucial role of education and exposure in shaping attitudes toward emerging healthcare technologies.

Building ethical legitimacy for AI in Nigeria's healthcare sector requires more than technological readiness; it necessitates transparent governance, inclusive policy frameworks, and sustained ethical engagement. Hospitals and policymakers must prioritize data protection, algorithmic fairness, and clear accountability structures to mitigate public apprehension and foster trust. Integrating AI ethics and governance modules into medical and ICT professional training will further strengthen competence and promote responsible innovation.

To advance ethical and trustworthy AI adoption in Nigerian healthcare, this study recommends the following:

1. Development of national and institutional ethical frameworks to guide AI deployment, ensuring compliance with global standards and contextual relevance.
2. Establishment of AI Ethics Oversight Committees in tertiary hospitals to continuously evaluate AI applications, monitor compliance, and promote accountability.
3. Comprehensive public education and engagement programs aimed at improving AI literacy, dispelling misconceptions, and encouraging informed participation in technology-driven healthcare.
4. Integration of data protection and algorithmic transparency mechanisms to safeguard patient privacy and build confidence in AI-assisted decision-making.
5. Promotion of interdisciplinary collaboration among medical practitioners, ICT experts, ethicists, and policymakers to create context-sensitive ethical guidelines reflective of Nigeria's socio-cultural and legal realities.

In conclusion, the sustainability of AI innovation in healthcare depends not merely on technical proficiency but on cultivating ethical consciousness, fairness, and trust. By embedding transparency, accountability, and human oversight at every stage of AI integration, Nigeria's healthcare institutions can ensure that technological progress aligns with moral responsibility and public good.

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