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Exploring the Experience and Perception of Artificial Intelligence Utilization among Students of Department of Nursing, Bayero University Kano

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ABSTRACT

Background: Artificial intelligence (AI) is rapidly transforming various sectors, including healthcare and education. In nursing, AI has the potential to enhance educational outcomes and improve clinical practices. The study aim to explore the nuanced experiences and perceptions of nursing students at Bayero University, Kano, in relation to the use of AI in their academic and clinical environments. **Methods:** A qualitative narrative inquiry was conducted among 12 nursing students at Bayero University, Kano. Focus group discussion was used to collect data from the participants. Thematic analysis was employed to identify and interpret themes related to their experiences and perceptions of AI. **Results:** The study identified that the majority of students have engaged with AI technologies primarily for academic purposes, such as researching assignments and accessing clinical information. However, they demonstrated limited awareness of nursing-specific AI tools. Participants also reported significant challenges related to network connectivity and data access, which hindered their use of AI. Despite these challenges, the overall perception of AI was positive, with students acknowledging its potential to improve nursing education and practice. Concerns about technical errors, over-reliance, and job displacement were also noted. Nursing students at Bayero University, Kano, recognize the potential benefits of AI in education and clinical practice but face significant challenges due to infrastructural limitations. Their positive perception of AI suggests an openness to its integration into nursing, provided that technological and educational barriers are addressed. **Conclusion:** The findings highlight the need for improved technological infrastructure, targeted training on AI applications in nursing, and a balanced approach to integrating AI with human expertise.

Keywords:

Artificial intelligence, Nursing education, Perceptions, Experiences, Qualitative, Nigeria

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INTRODUCTION

The advent of computer systems such with Artificial intelligence (AI) shows the evolution of how these systems are capable of performing tasks typically requiring human intelligence. These tasks may range from generating information, learn from data, make decisions, simulate human behavior express reasoning, and problem-solving skills (Buabbas et al., 2023; European Commission Joint Research Centre, 2018; Mahomed, 2018).

The rapid advancement of artificial intelligence (AI) is significantly transforming the landscape of higher education (OECD, 2023; UNESCO, 2021). The growing accessibility of AI technologies among students represents a key long-term impact of the increasing prevalence of AI tools designed for educational use, which could be seen as the evolution of what is known as "smart classrooms" and emphasizing how they are becoming increasingly integrated into various sectors, including education (Guanah & Oribhabor, 2023).



Consequently, the integration of AI technologies has prompted varied reactions within academia, leading some educational institutions to impose restrictions (Ladan, 2022). In the same regard, research exploring healthcare students and professionals' perceptions of AI has yielded mixed findings (Oluwadiya et al., 2023), with studies involving physicians and medical students in developed countries have shown optimism about AI's potential to improve efficiency and patient care (Blease et al., 2019; Wood et al., 2021).

Despite the widespread adoption of AI, there is a noticeable lack of research on to qualitatively explore students' experience and perceptions of AI, particularly in Nigeria. This study aims to address this gap by exploring the nuanced experiences and perceptions of AI utilization among nursing students of Bayero University, Kano.

METHODS

This qualitative study employed a narrative inquiry design, utilizing focus group discussions to gather in-depth insights from nursing students. The participants were selected through purposive sampling, ensuring they had experience using AI tools for academic tasks. A total of 12 participants engaged in discussions facilitated by the researchers, who recorded and transcribed the conversations for thematic analysis. Purposive sampling technique was used to select the participants for this study who have had used any AI tool for assignments or as an assistant in writing dissertation. Participants were explain the purpose and significance of the study, ensuring their informed consent was obtained. The discussion began with introductions, with the researcher

leading the session and recording the entire conversation. Important points raised by participants were noted, and the discussion lasted one hour and thirty minutes. All discussions were facilitated, encouraging participants to share their thoughts freely. The criteria for ensuring the trustworthiness of qualitative studies according to Lincoln & Guba (1985) were used in this study.

The data analysis in this study was conducted using thematic analysis. The process began with the precise transcription of the recorded focus group interview data, followed by a thorough examination of the transcripts through repeated readings. During the initial coding phase, meaningful words, phrases, and sentences related to the participants' experiences and perceptions of AI utilization were identified and coded. These codes were then grouped, classified, and categorized based on their similarities and differences. The generated codes and subcategories were defined accordingly. Three researchers were involved in the analysis, carefully extracting meaningful statements from the participants' responses by repeatedly reviewing and verifying the transcripts. The underlying meanings of these statements were identified in context and grouped into topics. These topics were further organized into broader categories, which were then integrated to form coherent sentences that reflected the overall findings of the study.

Ethical clearance with reference number NHREC/BUK-HREC/481/10/23II was sought from the Health Research Ethics Committee of College of Health sciences, Bayero University Kano.



RESULTS

Themes Identified

Table 1: Development of Themes

Codes	Sub-Themes	Theme
Technology for daily tasks, Efficient problem-solving, Task facilitation	Sub-Theme 1: What AI Means to Me	Navigating towards AI integration
Limited knowledge, General AI tools (e.g., Chat GPT), Nursing-specific AI	Sub-Theme 2: Lack of Insight into Nursing-Centric AI Technologies	
Positive influence of AI, Negative influence of AI	Sub-Theme 3: Perceived Positive and Negative Influences of AI in Nursing	
Benefits in education and practice, AI facilitating assignments, AI improving clinical research	Sub-Theme 4: Beneficial in Academic and Clinical Tasks	
AI in Education and Practice, Limited AI Interaction in Practice, Extensive AI Use	Sub-Theme 1: Diverse Experiences with AI in Nursing Education and Practice	Transformative and Enhance role of AI
AI for Assignments and Research, AI in Clinical Research, AI for Complex Topics	Sub-Theme 2: AI as a Resource for Information Gathering and Learning	
Enhanced Information Access, Improved Research and Assignment Efficiency, Quick and Specific Information Retrieval	Sub-Theme 3: Enhanced Access to Information	
Network Issues, Data Limitations, High Traffic Load	Sub-Theme 1: What AI Means to Me Challenges with Network and Data Access	
Incorrect Information, Over-Reliance on AI, Job Displacement, Errors in AI	Sub-Theme 2: Concerns and Risks Associated with AI Integration	Adapting with risks and opportunities
AI as Augmentation, AI in Other Disciplines, Limited AI Roles in Nursing	Sub-Theme 3: AI Integration Differences in Nursing vs. Other Disciplines	
Future AI Applications, Increased Efficiency, Improved Education	Sub-Theme 4: Future Changes in Nursing Due to AI	
Computer Literacy, ICT Skills, Training in Software, Tech Adaptation	Sub-Theme 5: Skills Needed for Adapting to AI Integration	



Theme 1: Navigating towards AI integration

This theme captures the evolving and complex relationship nursing students at Bayero University, Kano, are developing with artificial intelligence. It reflects how they are gradually integrating innovative AI tools into their traditional educational and clinical practices, while still grappling with limited awareness of AI's specific applications within their field. This theme highlights the tension and synergy between traditional nursing practices and the new frontier of AI-driven learning and practice. Four sub-themes emerged from this theme:

Sub-Theme 1: What AI Means to Me

This sub-theme reflects a collective perception among nursing students that artificial intelligence (AI) represents a transformative tool designed to simplify and enhance daily tasks. Participants view AI as a technological advancement that mirrors human intelligence, offering solutions and efficiencies that traditional methods might lack. It is perceived not just as a tool, but as a sophisticated system capable of streamlining complex processes and making problem-solving more accessible.

"If I hear the term artificial intelligence I think of using technologies to solve issues in our day-to-day activities." (Participant 1)

"On hearing the word artificial intelligence what comes to mind first is all about a tool developed with technological advances that help us to carry out our tasks easily." (Participant 4)

"When I hear the word artificial intelligence, what first comes to mind is a technological system that mimics human intelligence and helps in reasoning like the human mind, only in a more efficient manner, which helps to break down difficult tasks into simpler and more understandable components." (Participant 7)

"Basically when we say something is artificial intelligence it means an intelligence made by man which helps to ease the way people solve

problems, that could be anything, so basically artificial intelligence facilitates our ways of doing things." (Participant 8)

"The first thing that comes to mind when I hear the word artificial intelligence is a man-made software designed to carry out highly intellectual activities in a way that is equal to or even more efficient than a human being can do." (Participant 12)

Sub-theme 2: Lack of Insight into Nursing-Centric AI Technologies

This sub-theme reflects a significant gap in awareness among nursing students regarding artificial intelligence tools specifically designed for the field of nursing. Participants frequently mention their familiarity with general AI technologies such as ChatGPT and Bard, which are not tailored to nursing contexts.

"I don't know exactly the one that is specifically for nursing; I only know the general ones like ChatGPT and Bard." (Participant 1).

"Well, the one I use is basically ChatGPT, but I am not aware of one that is used specifically in the nursing field." (Participant 3)

"Yes, I am aware of visual assistance that gives basic medical advice and support." (Participant 4)

"I only know the simulation machine, but I don't know any AI currently being used in the hospital." (Participant 9)

"Yes, I only know ChatGPT." (Participant 10)

Sub-Theme 3: Perceived Positive and Negative Influences of AI in Nursing

This sub-theme reveals a nuanced view of artificial intelligence (AI) in the nursing field. Participants generally perceive AI as having a predominantly positive impact, citing its role in advancing knowledge, enhancing educational resources, and preparing students for future healthcare demands.

"Yes, I perceived it as a positive because it is an advancement of this century and helps to move nurses' knowledge forward." (Participant 4)



"I perceive it as a positive influence in the field of nursing education because it can enhance the quality of education, improving access to learning resources and preparing students for an evolving healthcare landscape." (Participant 7)

"Yes, I perceived it as a positive influence in the field of nursing because knowledge itself is a very core aspect of nurses, so it searches for knowledge." (Participant 8)

"It has both positive and negative influence, and I can say that the positive influence is more than the negative influence." (Participant 11)

"I perceive it as both positive and negative, but I side with the positive influence more than the negative influence." (Participant 12)

Sub-Theme 4: Beneficial in Academic and Clinical Tasks

Participants noted the benefits of AI in specific academic tasks, such as assignments, literature reviews, and clinical research.

"The beneficial part is what I have mentioned, usually for the assignment and some other class curriculum like doing my research." (Participant 3)

"It benefited me in my nursing studies in an instance of written assignments, so it really benefited me in that aspect." (Participant 4)

"For the benefit, like I said earlier, I used it to search information on a particular condition during our clinical posting in the ward, so in that instance, it benefited me a lot." (Participant 12)

Theme 2: Transformative and Enhancive role of AI

This theme delves into how nursing students encounter and utilize artificial intelligence (AI) within their educational and practical experiences. It reveals a spectrum of interactions with AI, reflecting its role in both enhancing and challenging their learning and clinical practices. Three sub-themes emerged from this theme.

Sub-theme 1: Diverse Experiences with AI in Nursing Education and Practice

Participants had varying degrees of experience with artificial intelligence, with some engaging with AI during both their studies and clinical practice, while others interacted with AI mainly in an academic setting.

"Yes, I have had an experiences with artificial in both my nursing study and practice" (Participant 2).

"Related to nursing practice I cannot say I have an encounter with artificial intelligence directly, both I engaged AI in my nursing study"- (Participants 6).

"Yes, I have had numerous experiences with artificial intelligence (Participant 7).

"Yes I have had related to my nursing education."(Participant, 9).

"Yes, I have had few experience with artificial intelligence". (Participant, 10)

Sub-theme 2: AI as a Resource for Information Gathering and Learning

AI was frequently used by participants as a tool for gathering information, particularly for assignments, research, and understanding complex topics. The use of AI in clinical settings was primarily centered on researching medical conditions encountered during practice.

"I recently had an experience with artificial intelligence during the NUNSA convention, where I engaged a simulation machine. That is the first time I had an experience with AI so far." (Participant 1)

"During my first week of clinical posting, we came across a patient with a colostomy, and our seniors asked us to research that particular condition. With the use of AI, I was able to gather a lot of information. AI also helped me in completing assignments during my nursing studies." (Participant 5)



"I had some experiences with artificial intelligence like ChatGPT and Google Bard. I mostly used them for assignments to generate essays and explain some complex things taught in class. If I want to get a deeper explanation, I usually go there to get in-depth information."
(Participant 8)

"I have used AI since my first day at the university to solve or break down complex topics that I found hard. But in clinical practice, I don't have any experience with artificial intelligence."
(Participant 11)

Sub-Theme 3: Enhanced Access to Information

Participants highlighted the significant impact of AI on their learning process, particularly in accessing information quickly and efficiently.

"It has impacted it a lot because it gives me access to information I want in nursing education or practice." (Participant 2)

"They impacted my learning a lot in making research and in written assignments."
(Participant 8)

"It has impacted it greatly in a positive way. If it was before, there are things you have to go online or Google, and you will not find exactly what you want, but due to those generative artificial intelligence, I will just type and it brings the answers, most times very specific to your queries." (Participant 11)

Theme 3: Adapting with risks and opportunities

This theme reflects the complex landscape of technological advancement in nursing education and practice. Five sub-themes emerged:

Sub-Theme 1: Challenges with Network and Data Access

This sub-theme addresses the practical issues hindering effective AI use. Participants experienced difficulties such as poor network connectivity, data limitations, and high traffic loads that affected their access to and interaction with AI tools. These

barriers underscore the need for improved infrastructure and resources to facilitate seamless AI integration.

"For the challenges, it's network issues."
(Participant 3)

"The challenging part I faced when using artificial intelligence is sometimes network issues and lack of data to get access to it." (Participant 4)

"For the challenges, I once asked artificial intelligence a particular question, but it failed to give me a response due to high traffic load on it."
(Participant 12)

Sub-Theme 2: Concerns and Risks Associated with AI Integration

The focus of this sub-theme is on the potential downsides and risks of AI in nursing. Participants expressed concerns about the accuracy of AI information, job displacement, and over-reliance on technology. The fears of technological errors and misdiagnosis highlight the need for careful management and oversight to ensure AI enhances rather than undermines nursing practice.

"The risk will be like I say it can bring the wrong information, which in turn could lead to poor outcomes in nursing practice and education."
(Participant 1)

"It can lead to giving wrong information, so over-reliance on it, for example, in making diagnoses as we are seeing now in developed countries, may lead to misdiagnosis." (Participant 3)

"My concern associated with the integration of AI in nursing includes issues of potential job displacement due to the automation of certain tasks." (Participant 6)

"My concern associated with the integration of artificial intelligence technologies is the issue of job displacement and over-reliance on AI technology, which may lead to a decrease in critical thinking, clinical skills, and technological errors." (Participant 9)



"So in every aspect, there will always be risks. Using AI, my fear is that artificial intelligence technologies are prone to errors, and you know we are dealing with human beings, not objects, so there might be catastrophic consequences when such errors occur." (Participant 12)

Sub-Theme 3: AI Integration Differences in Nursing vs. Other Disciplines

Participants observed that AI is more integrated and prioritized in other healthcare disciplines compared to nursing, where it is seen as an augmentative tool rather than a replacement.

"In other disciplines, I can say they are directly dependent on AI, probably AI can take over most of their responsibilities, unlike nursing, where AI will only augment our work instead of rendering it completely subordinate." (Participant 2)

"Well, in nursing education, you know there is something about humanity that we are dealing with. So AI cannot do most of the things, unlike in other disciplines where AI can do almost all their work." (Participant 6)

"My observation is that AI was not prioritized in nursing education as in other disciplines because there are so many tasks that cannot be performed by AI in nursing practice." (Participant 8)

Sub-theme 4: Future Changes in Nursing Due to AI

Looking ahead, participants discussed the transformative potential of AI in nursing. They envision AI improving efficiency, such as by monitoring vital signs remotely or managing larger patient loads, which could enhance both practice and education. This forward-looking perspective suggests that AI could drive significant advancements in the field.

"I think it will really help, for example, like now vital signs are still taken by nurses going from one bed to another, but in the future, we are going to have artificial intelligence that will

monitor vital signs of patients without nurses going to the bedside." (Participant 1)

"Well, in terms of stress, you know the nursing-patient relationship is actually wider than expected. So, if you have artificial intelligence around the bed space, it will limit this ratio while nurses can manage a greater number of patients." (Participant 3)

"Anything that is called advanced technology will bring a new advancement to nursing. The new advancement will positively change nursing practice in the future and also improve the quality of nursing education." (Participant 4)

"Actually, in the near future, we will see many artificial intelligence systems in the field of nursing carrying out many tasks of nurses like monitoring vital signs and others." (Participant 8)

"Well, it will improve effectiveness in both nursing practice and education in the future." (Participant 11)

Sub-theme 5: Skills Needed for Adapting to AI Integration

To effectively integrate AI, participants identified a need for enhanced technical skills among nurses. The emphasis is on computer literacy and familiarity with emerging technologies, underscoring the importance of training and education to ensure that nurses can fully utilize AI tools and adapt to technological changes.

"They have to be computer literate, so that everyone will have control of artificial intelligence, because it is man-made and software-programmed, and every software cannot control itself." (Participant 1)

"Computer skills will help them to be conversant in searching information through artificial intelligence technology." (Participant 4)

"The knowledge that nurses need to adapt includes computer skills and other emerging technologies." (Participant 9)



"Nurses need to have a lot of skills, especially at this time where everything is computerized. So they should be ICT literate." (Participant 10)

"They should be well-trained in computer software." (Participant 12)

DISCUSSION

AI's rapid advancement has led to its integration into various sectors, including education, where it is transforming traditional learning environments into "smart classrooms" (Guanah & Oribhabor, 2023). The accessibility of AI technologies among students signifies a long-term impact on educational practices, allowing for more personalized and efficient learning experiences. However, despite the potential benefits, there is a notable gap in the awareness of AI applications specifically designed for nursing (Oluwadiya et al., 2023).

Nursing students generally perceive AI as a transformative tool that enhances their educational experiences. Participants reported that AI facilitates access to information, streamlines research processes, and improves assignment completion. The ability to quickly gather data and insights from AI tools like ChatGPT and Google Bard has been particularly beneficial in academic settings. The perceived positive influence of AI extends to clinical practice, where students recognize its potential to enhance patient care and improve clinical decision-making. This aligns with findings from studies involving healthcare professionals in developed countries, who express optimism about AI's role in improving efficiency and patient outcomes (Blease et al., 2019; Wood et al., 2021).

Despite the benefits, nursing students also express concerns about AI's integration into their education and practice. Participants highlighted issues such as network connectivity problems, data limitations,

and the potential for over-reliance on AI tools, which could lead to inaccuracies in clinical decision-making. These concerns reflect broader apprehensions within the healthcare community regarding job displacement and the ethical implications of AI in medical decision-making (Buabbas et al., 2023; Oluwadiya et al., 2023). The fear of misdiagnosis due to reliance on AI-generated information underscores the need for careful management and oversight in integrating AI into nursing practice.

As nursing students anticipate future changes in their field due to AI, they recognize the importance of developing computer literacy and information and communication technology (ICT) skills. Training in AI technologies is essential for preparing students to adapt to the evolving landscape of healthcare. The integration of AI in nursing education requires a balanced approach that emphasizes both the benefits and challenges. Educational institutions must prioritize informing students about nursing-specific AI applications while addressing the infrastructural barriers that hinder effective AI use.

CONCLUSION

The experiences and perceptions of nursing students at Bayero University, Kano, regarding AI utilization reveal a complex relationship with this transformative technology. While students recognize the potential benefits of AI in enhancing their education and clinical practice, they also face challenges and concerns that must be addressed. As AI continues to evolve, it is crucial for nursing education to adapt accordingly, ensuring that students are equipped with the knowledge and skills necessary to navigate this new frontier in healthcare.



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