NURSES' KNOWLEDGE, PERCEPTION AND ROLES REGARDING THE USE OF ARTIFICIAL INTELLIGENCE IN NURSING CARE IN A TERTIARY INSTITUTION, BENIN CITY

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DECLARATION

This is to declare that this research project titled **"NURSES' KNOWLEDGE, PERCEPTION AND ROLES REGARDING THE USE OF ARTIFICIAL INTELLIGENCE IN NURSING CARE IN A TERTIARY INSTITUTION, BENIN CITY"** was carried out by OKHAIFO ANTHONIA ODION**.** It is solely the result of my work except where stated otherwise by reference or acknowledgement as being derived from other person(s) or resources.

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CERTIFICATION / APPROVAL

This is to certify that this project was carried out by **OKHAIFO ANTHONIA ODION**, mat number **BMS2001258,** Department of nursing science, under the supervision of **MRS C.C EDO-OSAGIE.**

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ABSTRACT

AI in healthcare has gained significant momentum in recent years, revolutionizing the delivery of medical services and transforming patient care processes across various specialties. Nursing, as a fundamental pillar of healthcare, is increasingly experiencing the impact of AI technologies, which range from decision support systems, robotics, predictive analytics, to personalized patient care applications. However, the successful adoption and optimal utilization of AI in nursing practice depend largely on nurses' knowledge, perceptions, and the roles they assume in its implementation. The aim of this study is to provide insights into the current knowledge and perceptions of nurses regarding AI, identifying potential gaps that could hinder effective practice. Understanding these gaps will help healthcare administrators and policy-makers design targeted interventions. This study employs a descriptive cross-sectional research design to investigate knowledge and perception of AI among nurses at the University of Benin Teaching Hospital (UBTH). A total of 257 participants were chosen using a stratified random sampling technique. A well self-structured questionnaire was used to access the knowledge, perception and roles of nurses as regards the use of AI among nurses in UBTH. The result shows, 74.3% of the respondents exhibiting correct knowledge of AI in comparison with the McDonald's scale indicates a moderate level of knowledge regarding AI. Also with a total mean score of 2.8, the study reveals that the respondents have a good perception of AI. Of the 257 respondents, 196 (76.3%) of the respondents strongly agreed that nurses should be involved in the planning and implementation of AI systems, 15(5.8%) disagreed, 31(12.1%) agreed while 15(5.8%) strongly disagreed. The mean response of the respondents is 2.53 which is greater than the average of 2.50 for a 4-point Likert scale, hence indicating the respondents generally agree that Nurses should be involved in the planning and implementation of AI systems. This study thus concluded that there is a fair knowledge, the respondents have good perception of AI and involving in the planning and implementation of AI systems are some of the roles of nurses in the use of AI.

KEY WORDS: ***Knowledge, Perception, Roles, Use of Artificial Intelligence, Nurses.***

DEDICATION

This research project is dedicated to God Almighty whose grace and mercy has kept me through the course of this study, and also to my dearest family and friends for their love and support.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The integration of artificial intelligence (AI) into healthcare has gained significant momentum in recent years, revolutionizing the delivery of medical services and transforming patient care processes across various specialties. Nursing, as a fundamental pillar of healthcare, is increasingly experiencing the impact of AI technologies, which range from decision support systems, robotics, predictive analytics, to personalized patient care applications. However, the successful adoption and optimal utilization of AI in nursing practice depend largely on nurses' knowledge, perceptions, and the roles they assume in its implementation (Topaz & Pruinelli, 2021).

Globally, AI is being incorporated into clinical practice to improve efficiency, enhance diagnostic accuracy, facilitate early intervention, and personalize patient care. In nursing, AI-driven tools are used for tasks such as patient monitoring, administrative duties, electronic documentation, and predictive modeling for patient deterioration (Blease et al., 2021). These tools are expected to relieve nurses from repetitive tasks, allowing them to dedicate more time to direct patient care and complex decision-making processes. Despite these advantages, there remains a significant gap in nurses' understanding and acceptance of AI technologies. Many nurses express concerns about job security, ethical considerations, dehumanization of care, and lack of sufficient training to use AI tools effectively (Jiang et al., 2021).

In the context of developing countries such as Nigeria, and specifically in tertiary health institutions in cities like Benin City, the application of AI in healthcare is still emerging. While the Nigerian health sector has witnessed some technological advancements, including the introduction of electronic medical records and telemedicine platforms, the integration of AI remains relatively limited (Okunlola et al., 2022). There is a pressing need to investigate how frontline healthcare providers, particularly nurses, perceive these advancements, their readiness to adapt to AI technologies, and the roles they are prepared to assume in facilitating the transition to AI-driven healthcare environments.

Nurses, as the largest group of healthcare professionals, are vital in ensuring the effective deployment and utilization of AI systems. Their roles are not limited to mere users of technology; they also serve as advocates for patient-centered AI solutions, collaborators in the design and implementation of AI tools, and evaluators of AI-driven care outcomes (Saba & McCormick, 2021). Therefore, understanding their current knowledge base and perceptions is essential in developing targeted educational programs, policy frameworks, and institutional support systems that promote the ethical and efficient use of AI in nursing care.

Research evidence has shown that knowledge gaps among nurses regarding AI can lead to resistance, improper use of technology, or underutilization of AI tools, which in turn can compromise patient care quality and safety (Amann et al., 2020). Furthermore, perceptions towards AI, whether positive or negative, can influence nurses' willingness to engage with these technologies. Positive perceptions often correlate with a greater willingness to embrace AI as a supportive tool in clinical practice, whereas negative perceptions are associated with fear, mistrust, and reluctance to change (Guo et al., 2020).

Given the critical role nurses play in the healthcare system, especially in tertiary institutions where complex and specialized care is delivered, it is important to explore their knowledge, perceptions, and roles regarding AI. In Benin City, where tertiary institutions like the University of Benin Teaching Hospital serve as referral centers for a vast population, nurses' readiness to incorporate AI into patient care could significantly influence healthcare outcomes. However, there is currently limited empirical data from this region on how nurses are engaging with the advent of AI in their practice settings.

Therefore, this study seeks to fill this gap by examining nurses' knowledge about AI, their perceptions towards its use in nursing care, and the roles they envisage for themselves in an AI-integrated healthcare environment within a tertiary institution in Benin City. Insights from this study will not only inform policy and training needs but also contribute to the broader discourse on preparing the nursing workforce for the future of technologically enhanced healthcare delivery.

1.2 Statement of the Problem

The rapid advancement of artificial intelligence (AI) technologies is reshaping healthcare delivery worldwide, promising improvements in patient outcomes, workflow efficiency, and clinical decision-making. In nursing care, AI has the potential to revolutionize routine practices through innovations such as automated documentation, predictive analytics for patient deterioration, clinical decision support systems, and robotic assistance (Topaz & Pruinelli, 2021). However, despite these potentials, the integration of AI into nursing practice faces considerable challenges, particularly concerning the readiness of nurses to adopt and effectively utilize these technologies (Blease et al., 2021).

Globally, studies have indicated that nurses often have limited knowledge about AI, its applications, and implications for clinical care (Guo et al., 2020). Many nurses perceive AI as a complex, intimidating concept, and some express concerns that it may replace the humanistic aspects of care, undermine clinical judgment, and threaten job security (Amann et al., 2020). These perceptions can create significant resistance to the adoption of AI technologies, potentially hindering healthcare institutions' efforts to leverage AI for improved patient care outcomes.

In Nigeria, and particularly in tertiary healthcare institutions such as those in Benin City, the use of AI in nursing care remains at a nascent stage. While there is increasing awareness of technological innovations in healthcare, including telemedicine and electronic health records, the practical exposure of nurses to AI systems remains limited (Okunlola et al., 2022). Existing healthcare infrastructures often lack the necessary technological support, and training opportunities for nurses on AI integration are scarce. This situation raises concerns about the capacity of the nursing workforce to adapt to and maximize the benefits of AI technologies when they eventually become widespread.

Moreover, there is a scarcity of empirical data on the level of knowledge, perceptions, and readiness of nurses in Nigeria regarding AI. Without such data, healthcare policymakers, educators, and hospital administrators may find it difficult to design appropriate interventions, training programs, and policies aimed at fostering a positive and informed approach to AI adoption among nurses. As Saba and McCormick (2021) emphasized, the success of health technology integration heavily depends on frontline healthcare workers' competencies and attitudes toward these innovations.

Failure to adequately prepare nurses for the AI era may not only lead to underutilization of available technologies but could also widen the gap between technological advancements and clinical practice, negatively impacting patient care quality and safety. Furthermore, if nurses are not actively involved in the development, implementation, and evaluation of AI systems, there is a risk that these technologies may not adequately reflect the needs of nursing practice or address the nuances of patient-centered care (Jiang et al., 2021).

In tertiary institutions such as those in Benin City, where complex and specialized care is the norm, the need for technologically competent nurses is even more critical. Nurses are expected to play crucial roles not just as users of AI but also as collaborators in developing AI-assisted care models, educators in training less experienced colleagues, and advocates for ethical AI use that safeguards patient rights and dignity.

Given these realities, there is an urgent need to explore and understand the current knowledge levels, perceptions, and perceived roles of nurses regarding AI in nursing care within the local context. This study aims to address this gap by investigating nurses in a tertiary institution in Benin City, providing insights that will guide training needs, inform policy development, and ultimately support the effective integration of AI into nursing practice.

1.3 Objectives of the Study

The main objective of this study is to assess nurses' knowledge, perceptions, and roles regarding the use of artificial intelligence in nursing care in a tertiary institution in Benin City.

The specific objectives are to:

1. Assess the level of knowledge nurses have about artificial intelligence and its applications in nursing care.
2. Explore nurses' perceptions towards the use of artificial intelligence in nursing practice.
3. Identify the roles nurses perceive themselves to play in the integration and utilization of artificial intelligence in nursing care.

1.4 Research Questions

To guide the study, the following research questions will be answered:

1. What is the level of knowledge nurses have about artificial intelligence and its applications in nursing care?
2. What are the perceptions of nurses towards the use of artificial intelligence in nursing practice?
3. What roles do nurses perceive themselves to play in the integration and utilization of artificial intelligence in nursing care?

1.5 Hypothesis

There is no significant relationship between the knowledge and perception of nurses regarding the use of artificial intelligence among nurses in a tertiary institution.

1.6 Significance of the Study

Nursing Practice: As the healthcare environment becomes increasingly reliant on AI technologies for patient care management, clinical decision support, and workflow optimization,

it is crucial that nurses are adequately prepared to adapt to these changes. This study will provide insights into the current knowledge and perceptions of nurses regarding AI, identifying potential gaps that could hinder effective practice. Understanding these gaps will help healthcare administrators and policy-makers design targeted interventions, such as continuous professional development programs, workshops, and hands-on training sessions, aimed at enhancing nurses' competence in using AI tools. Furthermore, by highlighting the roles nurses see for themselves in an AI-driven environment, the study will promote a proactive approach where nurses can confidently integrate technology into their daily routines, improving patient safety, care quality, and clinical efficiency.

Nursing Education: The integration of AI into nursing practice necessitates corresponding changes in nursing education. Findings from this study will inform curriculum developers, educators, and academic institutions about the current levels of awareness and understanding of AI among practicing nurses. This information will be critical in designing educational curricula that include AI concepts, ethical considerations, and practical applications tailored to nursing. Early exposure to AI during pre-service education will better equip future nurses to embrace and leverage technology in practice. Additionally, the study's results can serve as a foundation for developing specialized courses or modules on AI in healthcare, fostering technological literacy among nursing students and ensuring that the future nursing workforce is capable of thriving in a digitally transformed healthcare system.

Nursing Research: This study will contribute significantly to the growing body of knowledge on the intersection between nursing and emerging technologies. Given the limited data available, particularly within the Nigerian context and other similar low-resource settings, the findings will offer valuable baseline information for future research. It will identify areas where further

investigations are needed, such as exploring the long-term impacts of AI on nursing roles, ethical issues related to AI in patient care, and the effectiveness of educational interventions. Moreover, the study will stimulate scholarly interest in developing evidence-based strategies for integrating AI into nursing, encouraging continuous inquiry into best practices, barriers, and facilitators of AI adoption in diverse healthcare settings.

1.7 Scope of the Study

This study focuses on assessing the knowledge, perceptions, and roles of nurses regarding the use of artificial intelligence (AI) in nursing care within a tertiary institution in Benin City, Edo State, Nigeria. Specifically, the study will target registered nurses who are directly involved in patient care across different clinical units such as medical, surgical, maternity, pediatric, emergency, and intensive care departments.

1.8 Operational Definition of Terms

Knowledge: refers to the extent of information, awareness, and understanding that nurses have regarding artificial intelligence (AI) and its applications in nursing care. It specifically encompasses nurses' familiarity with the concept of AI, types of AI technologies used in healthcare, the functions of AI tools in clinical practice, potential benefits and risks associated with AI use, and ethical considerations related to AI integration in nursing. Knowledge will be measured by responses to a structured questionnaire assessing nurses' ability to correctly identify AI concepts, applications, advantages, challenges, and ethical implications. It will be categorized as poor, fair, or good based on the number of correct responses provided by each participant.

Perception: refers to the nurses' individual opinions, attitudes, beliefs, and feelings about the use of artificial intelligence (AI) in nursing care. It includes their views on the usefulness, ease of use, trustworthiness, potential benefits, risks, fears, and ethical concerns related to AI technology in their clinical practice. Perception will be measured through responses to a structured questionnaire using Likert-scale items (e.g., strongly agree to strongly disagree). Higher scores will indicate more positive perceptions towards AI integration in nursing care, while lower scores will indicate negative or skeptical perceptions.

Roles: refer to the specific functions, responsibilities, and contributions that nurses perceive themselves to have in the adoption, implementation, and effective utilization of artificial intelligence in nursing care. These roles include being users, advocates, collaborators in AI system development, educators for colleagues and patients, and guardians of ethical standards in AI use. Roles will be assessed based on nurses' responses to questionnaire items exploring their willingness, preparedness, and perceived responsibility in engaging with AI technologies in clinical settings.

Use of Artificial Intelligence: refers to the practical application of AI technologies by nurses within their clinical practice in a tertiary healthcare setting. It encompasses the interaction and integration of AI tools designed to support nursing activities, including but not limited to patient monitoring, decision-making assistance, clinical diagnostics, workflow automation, and administrative tasks. These AI tools may include predictive algorithms for identifying patient risks, AI-driven patient monitoring systems, electronic health record (EHR) management systems that utilize AI for data analysis, and automated medication dispensing or management systems. The use of AI will be assessed based on nurses' self-reported frequency and level of engagement with these technologies in their day-to-day activities. Specifically, the study will

examine how frequently nurses interact with AI tools, the types of AI technologies they have used, and their confidence in applying these tools in patient care scenarios. Nurses will be asked to identify AI systems they use in their practice and describe how these tools assist in tasks such as monitoring patient vitals, administering medications, making clinical decisions, or streamlining administrative processes. The extent of AI use will be measured using a structured questionnaire that includes both multiple-choice questions and Likert-scale items. These items will capture the nurses' level of familiarity with different AI technologies, their perceived ease of use, and how often they utilize AI systems in clinical practice. A higher frequency and confidence in using AI tools will indicate greater use of AI in nursing care.

Nurses: refers to registered nurses (RNs) employed at a tertiary healthcare institution in Benin City, who are directly involved in providing clinical care to patients. These nurses must possess a valid nursing license and have completed formal training in nursing, typically through a diploma, degree, or higher-level program. The study will focus on nurses working in various clinical settings, including medical, surgical, maternity, pediatric, emergency, and intensive care units. Nurses who have had at least six months of experience in clinical practice are considered eligible for participation, as this ensures they have sufficient exposure to nursing practices and technologies in the healthcare environment. Nurses' roles in the study will be assessed based on their professional experience, clinical duties, and direct engagement with AI technologies within the scope of their nursing practice.

CHAPTER TWO

LITERATURE REVIEW

CONCEPTUAL REVIEW

2.1 Artificial Intelligence (AI) in Healthcare

Artificial Intelligence (AI) refers to the ability of machines and computer systems to perform tasks that typically require human intelligence, such as learning, reasoning, problem-solving, perception, and decision-making (Jiang et al., 2021). In healthcare, AI encompasses the use of algorithms and software to approximate human cognition in the analysis, interpretation, and comprehension of complex medical and healthcare data.

The scope of AI in healthcare is expansive and continually growing. It ranges from administrative applications, such as scheduling and documentation, to clinical functions like diagnostics, patient monitoring, treatment recommendations, and precision medicine (Topol, 2021). AI has the potential to transform healthcare delivery by improving accuracy, efficiency, and personalization of care, thereby supporting both clinical and operational outcomes.

2.1.1 Types of AI Used in Healthcare

Several forms of AI are applied in healthcare, each serving unique purposes:

1. **Machine Learning (ML):** ML is a subset of AI that enables systems to learn from data and improve their performance over time without explicit programming. In healthcare, ML is used for tasks such as disease prediction, risk stratification, and personalized treatment recommendations. For instance, ML models have been employed to predict the onset of conditions like diabetes and sepsis (Esteva et al., 2021).

2. **Natural Language Processing (NLP):** NLP allows computers to interpret and generate human language. It is widely used in the analysis of unstructured clinical documentation, enabling efficient information extraction from patient records, radiology reports, and discharge summaries. This supports decision-making and reduces documentation workload (Davenport & Kalakota, 2021).

3. **Robotics:** AI-driven robots assist in both clinical and logistical tasks. Surgical robots, such as those used in minimally invasive procedures, enhance precision and control, leading to better outcomes. Care robots are also being developed to support elderly patients with daily activities, especially in long-term care settings (Nguyen et al., 2022).

4. **Rule-Based Expert Systems:** These are traditional AI systems that use predefined if-then rules to mimic decision-making processes. Though limited compared to machine learning, they are still used in clinical decision support systems (CDSS) (Rajkomar et al., 2021).

5. **Computer Vision:** This technology enables machines to interpret visual inputs. In healthcare, it is particularly useful in interpreting diagnostic images like X-rays, MRIs, and CT scans to detect abnormalities such as tumors or fractures (Litjens et al., 2021).

2.1.2 Applications of AI in Clinical Practice

AI applications in clinical settings are numerous and span a wide range of tasks that enhance the quality and efficiency of patient care:

1. **Diagnostics:** AI algorithms can analyze medical images and laboratory results with high precision, aiding in early and accurate diagnosis. For instance, deep learning models have

shown diagnostic performance comparable to expert dermatologists in identifying skin cancers (Esteva et al., 2021). AI is also being used in pathology and radiology to detect subtle patterns in imaging data.

2. **Patient Monitoring**: AI tools are used in continuous patient monitoring systems, particularly in intensive care units (ICUs) and for chronic disease management. These tools analyze real-time data from sensors and devices to detect clinical deterioration early and alert healthcare providers (Shickel et al., 2022).

3. **Clinical Decision Support (CDS):** AI supports clinicians by providing evidence-based recommendations tailored to individual patient data. CDS systems powered by AI can offer alerts for potential adverse drug interactions, suggest diagnostic tests, and recommend treatment options (Jiang et al., 2021).

4. **Predictive Analytics:** AI is employed to forecast patient outcomes based on historical and real-time data. This includes predicting hospital readmissions, sepsis onset, and disease progression, thereby enabling preemptive interventions (Rajkomar et al., 2021). Predictive models help prioritize care and allocate resources efficiently.

5. **Personalized Medicine:** AI facilitates the development of personalized treatment plans by analyzing genomic data, lifestyle factors, and clinical history to determine the most effective therapies for individual patients (Topol, 20121).

6. **Virtual Health Assistants:** Chatbots and virtual assistants, powered by AI, are being used to provide preliminary medical advice, medication reminders, and appointment scheduling, which enhances patient engagement and reduces provider workload (Davenport & Kalakota, 2021).

2.2 AI in Nursing Practice

2.2.1 Integration of AI into Nursing Workflows

The integration of Artificial Intelligence (AI) into nursing workflows is transforming the way nurses deliver care by automating routine tasks, supporting clinical decision-making, and enabling more personalized and proactive care. AI technologies are being embedded into various stages of the nursing process — assessment, planning, implementation, and evaluation — allowing nurses to focus more on patient-centered activities.

AI integration begins with electronic health records (EHRs), where intelligent systems extract and analyze patient data to offer real-time insights and recommendations. AI-driven decision support tools assist nurses in interpreting patient data, identifying deterioration signs, and flagging abnormalities, thereby enhancing clinical judgment (Topaz & Pruinelli, 2021). AI is also utilized in clinical documentation, automating note-taking and minimizing time spent on paperwork. In care coordination, AI systems help in resource allocation, patient prioritization, and workflow optimization. For example, predictive algorithms may flag high-risk patients for early intervention or identify those needing closer monitoring (Kellermann & Jones, 2023). Integration also extends to patient communication through AI chatbots and virtual assistants that support remote monitoring and guidance, especially in outpatient and home care settings. Despite the benefits, successful integration requires training, clear protocols, and collaboration between nurses, IT experts, and clinical leaders to ensure ethical use, reliability, and alignment with professional nursing standards (Buchanan & Wendt, 2020).

Examples of AI Tools Used by Nurses

Numerous AI tools are already enhancing nursing practice in various settings:

1. **Virtual Nursing Assistants (VNAs)**: These AI-powered systems provide 24/7 support for patients by answering health-related questions, reminding them to take medications, and monitoring symptoms. Tools like "Molly" by Sensely interact with patients using voice and text, helping to reduce unnecessary hospital visits and improve chronic disease management (Zhou et al., 2021).

2. **Documentation Automation**: AI-enabled voice recognition tools and natural language processing (NLP) systems are used to transcribe nurse-patient interactions and clinical notes, reducing documentation burden. Applications such as Dragon Medical One assist in real-time documentation, freeing up time for direct patient care (Davenport & Kalakota, 2021).

3. **Predictive Risk Scoring Tools**: These tools analyze real-time and historical patient data to predict adverse events such as pressure ulcers, sepsis, or falls. For example, the Epic Sepsis Model alerts nurses to patients at risk of sepsis based on vitals, lab results, and nursing notes (Sendak et al., 2020).

4. **Clinical Decision Support Systems (CDSS)**: Integrated into EHRs, CDSS use AI algorithms to suggest evidence-based care interventions, flag potential medication errors, or recommend lab tests, thus supporting clinical decision-making and improving safety (Topaz & Pruinelli, 2021).

5. **Remote Patient Monitoring Systems**: Wearable devices and sensors powered by AI continuously monitor patient vitals and transmit data to nurses. Alerts are generated for anomalies, allowing timely intervention. This is especially beneficial in managing elderly or post-operative patients at home (Nguyen et al., 2022).

2.2.2 Impact of AI on Nursing Efficiency and Patient Care Outcomes

AI significantly enhances nursing efficiency by automating repetitive tasks, reducing cognitive load, and enabling faster access to critical information. A key impact is time savings, with studies showing that AI tools can reduce documentation time by up to 30%, allowing nurses to dedicate more time to direct patient care (Davenport & Kalakota, 2021).

AI also improves care coordination by ensuring seamless communication among multidisciplinary teams. Intelligent scheduling systems optimize nurse staffing and match workload to skill level and patient acuity, reducing burnout and improving job satisfaction (Kellermann & Jones, 2023).

From a patient outcomes perspective, AI contributes to early detection and intervention. For instance, predictive tools allow nurses to identify signs of deterioration hours before traditional assessments would, enabling faster response and potentially saving lives (Sendak et al., 2020). AI also enhances patient engagement and self-management, particularly for chronic diseases, by offering real-time education, reminders, and symptom tracking.

Furthermore, AI systems improve accuracy in clinical documentation and medication administration, reducing the risk of errors and increasing overall safety. Nurses benefit from

decision support systems that back their clinical judgment with data-driven recommendations, enhancing care quality and consistency.

Nevertheless, the introduction of AI also brings challenges such as over-reliance on algorithms, data privacy concerns, and the need for continuous education and ethical awareness among nurses to maintain humanistic care in an increasingly digital environment (Buchanan & Wendt, 2020).

2.3 Nurses' Knowledge of Artificial Intelligence

As the integration of Artificial Intelligence (AI) into healthcare expands, nurses — who are the largest group of healthcare professionals — play a critical role in ensuring its effective and ethical use. Their understanding of AI principles, access to training, and ability to apply these technologies in clinical settings are essential for optimizing patient outcomes and adapting to future technological advancements.

2.3.1 Understanding of AI Principles and Tools Among Nurses

Understanding AI in nursing involves familiarity with basic concepts such as machine learning, natural language processing, decision support systems, and robotics, as well as their applications in clinical workflows. However, studies indicate that nurses generally possess limited knowledge of AI tools and principles, particularly regarding how these technologies make decisions or derive predictions (Topaz & Pruinelli, 2021).

Many nurses interact with AI tools indirectly — through electronic health record systems, clinical decision support systems, or patient monitoring platforms — without a full understanding of how these systems function or the data analytics behind them (Buchanan &

Wendt, 2020). This lack of foundational knowledge raises concerns about over-reliance on AI systems, misinterpretation of AI recommendations, and ethical considerations in delegating clinical decision-making to machines.

Furthermore, some nurses may confuse AI with general automation or digital technologies, not recognizing the distinct capabilities of AI such as adaptive learning, predictive analytics, or autonomous decision-making. As AI becomes more embedded in care delivery, it is crucial that nurses are equipped with conceptual and practical knowledge to engage confidently and responsibly with these tools (Kueper et al., 2022).

2.3.2 Training and Education on AI in Nursing Curricula and In-Service Training

The incorporation of AI education into nursing curricula remains inconsistent and insufficient globally. Most nursing education programs focus on basic computer literacy or the use of electronic health records, with limited exposure to data science, machine learning, or AI ethics (Booth et al., 2021). Where AI is included in formal education, it is often presented as part of health informatics or digital health courses, rather than as a standalone module. This results in fragmented understanding and limited competence in practical AI applications. A study by Kueper et al. (2022) emphasized the urgent need for comprehensive AI training frameworks within nursing education that include theoretical knowledge, ethical issues, and hands-on practice. In clinical settings, in-service training on AI is even more limited. Nurses often receive product-specific instruction when new AI tools are implemented, but this training typically focuses on operational aspects rather than underlying AI principles, risk evaluation, or decision-making frameworks (McBride et al., 2019).

To bridge this gap, experts advocate for interprofessional AI education, continuous professional development opportunities, and the inclusion of AI competencies in nursing licensure and accreditation standards (Booth et al., 2021). Empowering nurses with AI knowledge is essential not only for safe technology use but also for active participation in the design and governance of AI in healthcare.

2.3.3.Knowledge Gaps and Barriers to Understanding AI

Despite growing interest, several knowledge gaps and barriers hinder nurses' understanding of AI:

1. **Limited Exposure and Access to Training**: Many nurses have little to no exposure to formal AI training or resources. This is particularly common in low-resource settings, where access to digital technologies and education is limited (Topaz & Pruinelli, 2021).
2. **Lack of Standardized AI Competency Frameworks**: There is no widely accepted framework outlining the specific AI competencies nurses should acquire. Without standardized learning outcomes, training programs vary in quality and depth (Booth et al., 2021).
3. **Technological Complexity**: The technical nature of AI, including concepts like neural networks or algorithmic bias, can be intimidating to nurses without a background in computer science or data analytics. This creates a **perceived barrier** to learning and application (Kueper et al., 2022).

4. **Fear of Job Displacement**: Some nurses view AI as a threat to job security or fear that increased automation could reduce their professional autonomy. This perception may lead to **resistance to engagement** with AI education or initiatives (McBride et al., 2019).

5. **Ethical and Legal Concerns**: Nurses often express concerns about the **ethical implications** of using AI in patient care, particularly in terms of accountability, informed consent, and patient privacy. However, without adequate knowledge of AI capabilities and limitations, these concerns can be amplified and remain unaddressed (Buchanan & Wendt, 2020).

6. **Workload and Time Constraints**: The demanding nature of nursing practice often leaves little time for additional learning, making it difficult for nurses to engage in self-directed study or attend training sessions focused on AI (Topaz & Pruinelli, 2021).

2.4 Nurses' Perception of Artificial Intelligence

The perception of Artificial Intelligence (AI) among nurses significantly influences its adoption, integration, and utilization in clinical practice. Nurses' attitudes toward AI are shaped by various factors including their knowledge, experience with technology, workplace culture, and concerns related to ethics and professional roles. Understanding these perceptions is crucial for guiding effective implementation strategies and educational interventions.

2.4.1 Attitudes Toward AI in Nursing

Overall, nurses display mixed perceptions of AI technologies. Some view AI as a valuable tool that can enhance decision-making, reduce administrative burden, and improve patient outcomes. Others, however, express skepticism or fear, often due to misconceptions about AI replacing

human roles or concerns about safety and accountability (Strudwick et al., 2021). Positive perceptions are frequently associated with prior exposure to AI systems or participation in training programs. Nurses who understand how AI tools function are more likely to trust and utilize them appropriately (Booth et al., 2021). On the other hand, those who lack technical understanding or who have experienced technical failures may develop resistance or distrust toward these innovations.

Furthermore, many nurses see AI as a potential enhancer of nursing practice rather than a replacement. They appreciate AI's ability to support repetitive tasks, provide early warnings for clinical deterioration, and streamline documentation, thus allowing them to focus more on patient-centered care (Kostick et al., 2022).

2.4.2 Perceived Benefits of AI

Nurses have identified several benefits of AI in clinical care:

1. **Improved Efficiency**: AI can automate time-consuming tasks such as documentation, allowing nurses to spend more time with patients (Topaz & Pruinelli, 2021).
2. **Enhanced Clinical Decision-Making**: AI-powered decision support systems assist nurses by offering data-driven recommendations, reducing cognitive workload (Davenport & Kalakota, 2021).
3. **Proactive Patient Monitoring**: AI systems help in real-time monitoring and early detection of health deterioration, improving patient safety (Sendak et al., 2020).

4. **Support in Chronic Disease Management**: AI enables continuous engagement through virtual assistants, which can assist patients with self-care and medication adherence (Zhou et al., 2021).

These benefits align with the values of nursing, including safety, efficiency, and patient-centeredness, contributing to more positive perceptions among practitioners.

2.4.3 Perceived Concerns and Risks

Despite these advantages, nurses also express several concerns regarding AI:

1. **Fear of Job Displacement**: There is a common worry that automation may lead to the reduction of nursing roles or compromise the human touch in care (McBride et al., 2021).
2. **Loss of Autonomy**: Some nurses fear that reliance on AI might undermine their clinical judgment or lead to an overdependence on technology (Kueper et al., 2022).
3. **Data Privacy and Ethical Issues**: Concerns about patient confidentiality, data misuse, and ethical decision-making are prevalent, particularly in AI systems that lack transparency (Buchanan & Wendt, 2020).
4. **Liability and Accountability**: Nurses often question who would be held responsible in case of errors made by AI systems — the nurse, the institution, or the developer (Booth et al., 2021).

These concerns emphasize the importance of involving nurses in the design, implementation, and governance of AI technologies to ensure their practical and ethical integration.

2.4.4 Influence of Organizational Culture and Support

Workplace culture plays a pivotal role in shaping nurses' perception of AI. In institutions where technology adoption is well-supported, and where nurses are actively involved in the implementation process, perceptions are generally more positive (Strudwick et al., 2021). Conversely, a lack of leadership support, inadequate training, or poor communication about AI objectives can foster mistrust and resistance. Interdisciplinary collaboration, transparent AI governance, and clear role definitions further support a positive outlook among nurses. When nurses are given a voice in AI policy decisions, they are more likely to perceive these tools as allies rather than threats (Booth et al., 2021).

2.5 Nurses' Roles in the Use of Artificial Intelligence

Nurses play a crucial role in the implementation, utilization, and evaluation of Artificial Intelligence (AI) in healthcare settings. Their direct involvement with patients and their operational knowledge of clinical workflows position them as key stakeholders in ensuring the safe, ethical, and effective application of AI technologies in nursing care. Understanding the various dimensions of these roles is essential to maximizing AI's benefits while preserving the core values of nursing practice.

2.5.1 Roles in the Implementation and Adoption of AI Tools

Nurses serve as frontline implementers of AI systems in healthcare, especially in tertiary institutions where digital transformation is more prevalent. They often engage in pilot testing, evaluation, and feedback provision during the rollout of AI applications such as clinical decision support systems, patient monitoring devices, and documentation tools (Strudwick et al., 2021).

Their insights are vital for identifying usability challenges, workflow integration issues, and potential safety risks. For AI to be successfully implemented, it must align with the clinical realities nurses face daily. As such, nurse involvement in the design and development process of AI tools is critical to ensure that the technology complements rather than disrupts care delivery (Booth et al., 2021). Moreover, nurses play a leadership role in advocating for ethical and patient-centered AI use, guiding institutions in creating policies that prioritize human oversight, patient autonomy, and data privacy (McBride et al., 2019).

2.5.2 Clinical Roles: Using AI in Direct Patient Care

Nurses apply AI technologies in various aspects of clinical care. These roles include:

1. **Clinical Decision Support**: Nurses use AI-powered tools to assist in diagnosis, medication administration, and risk stratification. For example, predictive models may alert nurses to early signs of patient deterioration, such as sepsis or cardiac events (Sendak et al., 2020).

2. **Virtual Health Assistants**: Some nurses work alongside AI chatbots and virtual agents that provide routine patient education, reminders, or triage support, especially in outpatient and telehealth settings (Zhou et al., 2021).

3. **Smart Documentation and Workflow Management**: AI tools automate nursing documentation, schedule optimization, and inventory tracking, allowing nurses to focus more on direct patient care (Topaz & Pruinelli, 2017).

4. **Chronic Disease Management**: Nurses collaborate with AI-enabled remote monitoring tools to track vital signs, patient adherence, and symptom progression in chronic conditions like diabetes or heart failure (Kueper et al., 2022).

Through these roles, nurses enhance the quality, efficiency, and responsiveness of care delivery, demonstrating their essential function in the AI-powered healthcare ecosystem.

2.5.3 Educational and Advocacy Roles

Nurses also act as educators and advocates—both within healthcare teams and toward patients—by demystifying AI and promoting its appropriate use. They help colleagues understand the capabilities and limitations of AI, fostering a culture of critical thinking and informed usage. Among patients, nurses play a key role in explaining AI-driven decisions, building trust in the technology, and ensuring patients understand how their data is used (Buchanan & Wendt, 2020). Furthermore, nurse leaders and informaticists contribute to developing AI policies, training programs, and ethical guidelines, ensuring that the nursing perspective is integrated into broader institutional decisions about AI implementation (Strudwick et al., 2021).

2.5.4 Ethical and Regulatory Oversight Roles

Nurses are increasingly called upon to participate in discussions around the ethical governance of AI. This includes evaluating algorithmic bias, ensuring transparency of AI decisions, and protecting patient rights in the context of AI surveillance and data use (McBride et al., 2019).

In tertiary care institutions, especially, nurses serve as liaisons between technology and patients, advocating for AI systems that respect human dignity, avoid discrimination, and preserve clinical empathy. They are key contributors to ensuring that AI aligns with the ethical foundations of

nursing practice, including beneficence, non-maleficence, and patient advocacy (Booth et al., 2021).

2.5.5 Challenges in Role Execution

Despite their potential, nurses face several challenges in fulfilling these roles:

- **Lack of Training**: Many nurses are not adequately trained to use or evaluate AI tools.
- **Limited Involvement in Decision-Making**: Nurses are often excluded from strategic discussions on AI procurement and design.
- **High Workload**: Time constraints limit their ability to engage in AI-related initiatives or education.
- **Cultural Resistance**: Organizational resistance to change may hinder the adoption of nurse-led AI initiatives (Strudwick et al., 2021).

Addressing these barriers through targeted training, inclusion in policy development, and cultural change initiatives is essential to fully harness the value nurses bring to AI integration.

2.6 Theoretical Review

The theory that underpinned this study is Technology Acceptance Model (TAM). The Technology Acceptance Model (TAM) was developed by Fred Davis in 1986 and is one of the most influential theories for explaining and predicting user behavior towards technology. The core premise of TAM is that two key factors influence users' intention to accept and use a new technology:

1. **Perceived Usefulness (PU)** – the degree to which a person believes that using a particular system would enhance their job performance.

2. **Perceived Ease of Use (PEOU)** – the degree to which a person believes that using a system would be free from effort.

According to TAM, these two constructs determine a user's attitude toward using the system, which in turn affects their behavioral intention to use, ultimately leading to actual system use. Over time, TAM has evolved and been extended (e.g., TAM2, TAM3, and the Unified Theory of Acceptance and Use of Technology – UTAUT), but the original TAM remains a foundational model for understanding acceptance behavior in technology adoption, particularly in healthcare.

Key Constructs of TAM

- **Perceived Usefulness (PU):** If nurses believe that AI tools can improve clinical outcomes, efficiency, or decision-making, they are more likely to adopt and engage with them.

- **Perceived Ease of Use (PEOU):** If AI technologies are designed to be intuitive and require minimal training, nurses are more likely to find them acceptable and integrate them into their routine.

- **Attitude Toward Use:** This reflects nurses' positive or negative feelings toward AI.

- **Behavioral Intention:** The likelihood that nurses will adopt AI in their practice based on their perceptions.

Application of TAM to the Study

TAM provides a useful lens through which to explore and interpret how nurses engage with AI technologies.

1. Nurses' Knowledge and TAM

- Training and knowledge influence Perceived Ease of Use. Nurses who are familiar with the principles and functioning of AI tools are likely to find them easier to use.
- Education and professional development initiatives can directly affect Perceived Usefulness, as understanding how AI enhances patient care increases the likelihood of acceptance.

2. Nurses' Perception and TAM

- Nurses' positive or negative perceptions of AI reflect their Attitude Toward Use.
- Factors such as job displacement fears, ethical concerns, or workload pressure can negatively impact perceived usefulness and ease of use, thereby decreasing acceptance.
- On the other hand, perceived benefits like decision support and improved efficiency contribute to more favorable attitudes.

3. Nurses' Roles and TAM

- The extent to which nurses are involved in AI deployment (e.g., feedback during implementation, customization of AI tools) can influence both perceived usefulness and ease of use.
- Their willingness to act as educators or advocates for AI also depends on their personal acceptance, shaped by TAM constructs.

4. Behavioral Intentions and Use

- By measuring how TAM components influence intention, your study can predict whether nurses will adopt AI technologies in practice.
- Understanding behavioral intention allows healthcare institutions to design targeted interventions that address nurses' concerns and improve acceptance.

In tertiary institutions in Nigeria, including those in Benin City, digital health technologies like AI are still emerging. Nurses' readiness to adopt such innovations may be influenced by infrastructural limitations, workload, technological literacy, and existing attitudes toward automation. Using TAM helps contextualize these factors and provides a framework to assess which variables most strongly predict adoption behaviors in this setting.

2.7 Empirical Review

Knowledge of Artificial Intelligence among Nurses

A study by Mohammed et al., (2023) on Effect of Educational Program on Nurses' Knowledge and Attitude Regarding Artificial Intelligence was conducted using a quasi-experimental design involving 203 nurses from Mansoura University Hospitals. The findings from the study revealed that prior to the educational intervention, only 16.3% of nurses had satisfactory knowledge about AI, post-intervention, this figure rose to 82.8%, slightly decreasing to 68% at follow-up. The study equally revealed that attitude scores improved significantly from a mean of 53.35 pre-intervention to 77.19 immediately after, settling at 67.95 during follow-up and the internet was the primary source of AI information for 73.9% of participants. The study concluded that educational programs significantly enhance nurses' knowledge and attitudes toward AI, underscoring the need for ongoing training and workshops.

Another study on Knowledge and Attitude of Nursing Students Regarding Artificial Intelligence by Shams et al., (2024) was conducted using a descriptive cross-sectional study with 222 nursing students. The findings from the study revealed that 65.6% of students exhibited a moderate level of AI knowledge, 82.6% displayed positive attitudes toward AI and a significant positive correlation was found between knowledge levels and attitudes. The study concluded that there's a pressing need to integrate AI-focused training, webinars, and seminars into nursing education to bolster both knowledge and positive perceptions.

A study by Nazeh et al., (2024) on Intensive Care Nurses' Knowledge and Perception Regarding Artificial Intelligence Applications was conducted using a descriptive study involving 160 ICU nurses from Suez-Canal and Ain Shams University Hospitals. The findings from the study revealed that approximately two-thirds of ICU nurses had unsatisfactory knowledge about AI, the majority held moderate perceptions regarding AI applications and a significant correlations were observed between nurses' knowledge/perceptions and factors like age, education level, and

ICU experience. The study concluded that there's a critical need to provide ICU nurses with comprehensive information about AI's benefits, challenges, and implementation to enhance healthcare processes.

Another study was conducted on Healthcare Workers' Knowledge and Attitudes Regarding Artificial Intelligence Adoption in Healthcare: A Cross-Sectional Study by Dhaka et al., (2024). The findings from the study revealed that 39.26% of participants demonstrated good AI knowledge, 73.06% had a positive attitude toward AI adoption, younger professionals (ages 18–35) and those exposed to AI through conferences or research articles exhibited better knowledge and attitudes and strong positive correlation ($r = 0.89$) was found between knowledge and positive attitudes. The study concluded that targeted educational interventions are essential to bridge knowledge gaps and foster positive attitudes toward AI among healthcare workers.

A study by Hanzel et al., (2023) on Utilization of Artificial Intelligence in Health Care: Nurses' Perspectives and Attitudes was conducted using a survey-based study design. The findings from the study revealed that 92% of nurses had a moderate perception of AI usage in healthcare, 64% exhibited a positive attitude toward AI adoption and a significant differences in perceptions and attitudes were linked to factors such as gender, age, qualifications, and years of experience. The study concluded that to enhance AI integration in healthcare, it's vital to develop strategies that increase institutional readiness and provide nurses with appropriate training.

Perception of Nurses towards Artificial Intelligence

A study by Tuncer et al., (2024) on Investigation of nurses' general attitudes toward artificial intelligence and their perceptions of ChatGPT usage and influencing factors was conducted using 288 nurses who participated in the study between December 2023 and March 2024. Data were

collected through an account on a social media platform via Google Forms using the Information Identification Questionnaire for ChatGPT and Artificial Intelligence Programs and the General Attitudes to Artificial Intelligence Scale (GAAIS). The findings from the study revealed that the mean scores obtained from the overall GAAIS and its Positive Attitudes subscale from the participants in this study were 67.54 ± 13.14 and 41.89 ± 11.24, respectively. Of the participants, 48.3% knew about ChatGPT and artificial intelligence programs. Of the participants, 27.8% used ChatGPT and artificial intelligence programs. Their scores for the Positive Attitude subscale were higher than were the scores of those who did not use such programs. Of the participants, 84.4% thought that nurses should be made aware of ChatGPT and artificial intelligence programs, 67% thought that the use of these programs would contribute to nurses' professional development, 42.4% thought that the use of these programs would not reduce nurses' workload, and 58.3% thought that the use of these programs would positively affect patient care. The study concluded that nurses in Turkey have positive attitudes toward integrating ChatGPT and AI programs to improve patient outcomes and add them to nursing practices.

Another study on Perceptions and attitudes of nurse practitioners toward artificial intelligence adoption in health care by Rony et al., (2024), a qualitative research was conducted using a descriptive and phenomenological approach using in-depth interviews. Data were collected through a semi-structured questionnaire with 37 nurse practitioners selected through purposive sampling, specifically Maximum Variation Sampling and Expert Sampling techniques, to ensure diversity in characteristics. Trustworthiness of the research was maintained through member checking and peer debriefing. Thematic analysis was employed to uncover recurring themes and patterns in the data. The findings from the study revealed that the thematic analysis revealed nine main themes that encapsulated nurse practitioners' perceptions and attitudes toward AI adoption

in health care. These included nurse practitioners' perceptions of AI implementation, attitudes toward AI adoption, patient-centered care and AI, quality of health care delivery and AI, ethical and regulatory aspects of AI, education and training needs, collaboration and interdisciplinary relationships, obstacles in integrating AI, and AI and health care policy. While this study found that nurse practitioners held a wide range of perspectives, with many viewings AI as a tool to enhance patient care. The study concluded that this research provides a valuable contribution to the evolving discourse surrounding AI adoption in health care. The findings underscore the necessity for comprehensive education and training in AI, accompanied by clear and robust ethical and regulatory guidelines to ensure the responsible integration of AI in health care practice. Furthermore, fostering collaboration and interdisciplinary relationships is pivotal for the successful incorporation of AI in health care. Policymakers should also address the challenges and opportunities that AI presents in the health care sector. This study enhances the ongoing conversation on AI adoption in health care by shedding light on the perspectives of nurses, thereby shaping future strategies for AI integration.

A study by Kaplan et al., (2024) on Attitudes of nurses toward artificial intelligence: A multicenter comparison was conducted using a descriptive cross-sectional design. The study population consisted of 1453 nurses working in 3 state hospitals (inpatient hospitals providing secondary health care services) located in the city centers of Muş, Bingöl and Adıyaman provinces in eastern Turkey. While the sample size was 698 nurses in total, the study was completed with 737 nurses. The data were collected through the Introductory Information Form and the General Attitudes toward Artificial Intelligence Scale (GAAIS). ANOVA test and multiple regression were used to analyse the data. The findings from the study revealed that the nurses had highly positive attitudes towards artificial intelligence. When the nurses' scores from

the Positive GAAIS sub-dimension were compared, it was determined that there was a significant difference ($p < 0.05$) between the provinces. A statistically significant difference ($p < 0.01$) was found between the provinces in the Negative GAAIS sub-dimension, as well. Demographic characteristics were found to be effective on both Positive GAAIS and Negative GAAIS. The study concluded that although there were differences between the provinces, the nurses generally had positive attitudes towards artificial intelligence technologies. The majority of the participants continue to use artificial intelligence technologies although they state that artificial intelligence will replace humans in the future. Longitudinal studies on the factors affecting attitudes towards artificial intelligence are recommended.

A study by Wang et al., (2024) on Knowledge and attitudes toward artificial intelligence in nursing among various categories of professionals in China, an online cross-sectional study was conducted on nursing students, nurses, other healthcare professionals, AI-related professionals, and others in China between March and April 2024. They were invited to complete a questionnaire containing 21 questions with four sections. The survey followed the principle of voluntary participation and was conducted anonymously. The participants could withdraw from the survey at any time during the study. This study obtained 1,243 valid questionnaires. The participants came from 25 provinces and municipalities in seven regions of China. Regarding knowledge of AI in nursing, 57% of the participants knew only a little about AI, 4.7% did not know anything about AI, 64.7% knew only a little about AI in nursing, and 13.4% did not know anything about AI in nursing. For attitudes toward AI in nursing, participants were positive about AI in nursing, with more than 50% agreeing and strongly agreeing with each question on attitudes toward AI in nursing. Differences in the numbers of participants with various categories of professionals regarding knowledge and attitudes toward AI in nursing were statistically

significant ($p < 0.05$). Regarding concerns and ethical issues about AI in nursing, every participant expressed concerns about AI in nursing, and 95.7% of participants believed that it is necessary to strengthen medical ethics toward AI in nursing. The study concluded that nursing students and healthcare professionals lacked knowledge about AI or its application in nursing, but they had a positive attitude toward AI. It is necessary to strengthen medical ethics toward AI in nursing. The study's findings could help develop new strategies benefiting healthcare.

A study by Al-Sabawy et al., (2023) on Artificial Intelligence in Nursing: A study on Nurses' Perceptions and Readiness was conducted using a cross-sectional exploratory survey of nurses through Google Forms to achieve the study objective, the responses were returned online from 410 nurses in the Kirkuk Health Department. The survey collected information on demographic profiles, understanding and sources of AI knowledge, and attitudes toward AI adoption in nursing practices. The findings from the study revealed that 42.7% of nurses gained knowledge about AI through various platforms, including news outlets, media broadcasts, and social networks. About 51% had a moderate perception of AI utilization in nursing practice, while 47% showed a high level of perception. Remarkably, 84% demonstrated a positive attitude toward the adoption of AI in their nursing practice. The study uncovered a significant degree of variability in understanding and comfort with AI, with many individuals gaining their knowledge through passive channels. Notably, educational level influenced nurses' attitudes toward AI, with those possessing higher educational qualifications tending to view AI more favorably. Recommendations: The findings underscore the need for more comprehensive and accessible AI education, particularly in the nursing practice. It is also crucial to address concerns or discomfort associated with AI to encourage its broader adoption across various fields in nursing. Proper

training, transparent communication about AI's capabilities and limitations, and stringent ethical guidelines will be crucial in optimizing the integration of AI into nursing practice.

Roles of Nurses in Artificial Intelligence

A study by Khatid et al., (2025) on Examining the Role of AI in Changing the Role of Nurses in Patient Care: Systematic Review was conducted by compiling pertinent data on AI and nursing and their relationship, we conducted a thorough systematic review literature analysis using secondary data sources, including academic literature from the Scopus database, industry reports, and government publications. A total of 401 resources were reviewed, and 53 sources were ultimately included in the paper, comprising 50 peer-reviewed journal articles, 1 conference proceeding, and 2 reports. To categorize and find patterns in the data, we used thematic analysis to categorize the systematic literature review findings into 3 primary themes and 9 secondary themes. To demonstrate whether a role change existed or was forecasted to exist, case studies of AI applications and examples were also relied on. The research shows that all health care practitioners will be impacted by the revolutionary technology known as AI. Nurses should be at the forefront of this technology and be empowered throughout the implementation process of any of its tools that may accelerate innovation, improve decision-making, automate and speed up processes, and save overall costs in nursing practice. This study adds to the existing body of knowledge about the applications of AI in nursing and its consequences in changing the role of nurses in patient care. To further investigate the connection between AI and the role of nurses in patient care, future studies can use quantitative techniques based on recruiting nurses who have been involved in AI tool deployment—whether from a design aspect or operational use—and gathering empirical data for that purpose.

A study by Wesam et al., (2025) on Application of artificial intelligence in nursing practice: a qualitative study of Jordanian nurses' perspectives was conducted using a qualitative research approach involving semi-structured interviews with 25 nurses and 3 focus group discussions, each consisting of 7–8 participants. The data collected was coded and analyzed using thematic analysis to identify recurring patterns and key themes in the nurses' views on AI. The findings from the study revealed that three major themes emerged from the analysis: (1) AI as an efficiency tool – Nurses recognized AI's ability to reduce administrative burdens and improve patient monitoring in real-time. (2) Ethical and practical concerns – Nurses raised issues regarding patient privacy, data security, and the fear that AI might replace human decision-making in care. (3) Lack of preparedness and training – There was a consensus on nurses' inadequate training in AI tools, limiting their ability to integrate AI into their practice fully. The study concluded that while AI is seen as a valuable tool to enhance nursing productivity, several challenges still need to be addressed, particularly regarding ethical concerns and insufficient training. To ensure AI complements nursing without compromising the human element, healthcare institutions must address these issues by implementing comprehensive training programs and establishing clear ethical guidelines.

A study by Silva et al., (2024) on Artificial Intelligence in the Organization of Nursing Care: A Scoping Review

was carried out based on the Joanna Briggs Institute methodology, following the PRISMA-ScR guidelines, in the MEDLINE, CINAHL Complete, Business Source Ultimate and Scopus® databases. We used ProQuest—Dissertations and Theses to search gray literature. Ten studies were evaluated, identifying AI-mediated tools used in the organization of nursing care, and synthesized into three tool models, namely monitoring and prediction, decision support, and

interaction and communication technologies. The contributions of using these tools in the organization of nursing care include improvements in operational efficiency, decision support and diagnostic accuracy, advanced interaction and efficient communication, logistical support, workload relief, and ongoing professional development. The study concluded that AI tools such as automated alert systems, predictive algorithms, and decision support transform nursing by increasing efficiency, accuracy, and patient-centered care, improving communication, reducing errors, and enabling earlier interventions with safer and more efficient quality care.

2.8 Summary of Literature Review

The integration of Artificial Intelligence (AI) into healthcare has gained momentum in recent years, revolutionizing the way care is delivered and managed. Within the nursing profession, the application of AI holds great potential in areas such as clinical decision support, patient monitoring, and administrative efficiency. However, the extent of AI utilization is heavily dependent on nurses' knowledge, perceptions, and their perceived roles in its implementation and use. Several empirical studies suggest that nurses globally have limited knowledge of AI applications in clinical practice. This gap in knowledge is particularly prominent in developing countries, including Nigeria, where exposure to AI in nursing education and practice is minimal. A lack of formal training and inclusion of AI in nursing curricula are major contributing factors. Studies also indicate a positive correlation between nurses' knowledge levels and their perceptions of AI—nurses with higher awareness tend to hold more favorable views regarding its benefits in enhancing care quality and reducing workload.

Perception plays a critical role in the adoption of AI technologies. While many nurses express optimism about AI's ability to improve care delivery and streamline tasks, concerns persist. Common apprehensions include the fear of job displacement, ethical issues like data privacy, and the potential dehumanization of care. These perceptions are shaped by both personal experiences and institutional support systems, including training opportunities and organizational readiness for AI adoption. Nurses also play crucial roles in the integration and utilization of AI. These roles include acting as clinical informants during system design, participating in training and evaluation of AI tools, and ensuring that AI applications align with patient-centered care values. However, a consistent theme in the literature is the underutilization of nurses in the decision-making and implementation stages of AI integration. Empowering nurses through targeted education, involvement in interdisciplinary planning, and professional development is essential to bridge this gap. In the context of Benin City and similar tertiary healthcare settings in sub-Saharan Africa, there is limited localized research on how nurses engage with AI. Existing studies highlight an urgent need to assess baseline knowledge, address misconceptions, and promote policies that integrate AI competencies into nursing education and continuous professional development programs.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0. INTRODUCTION

This chapter outlines the research methodology used by the researcher to conduct the study. Research methodology refers to the steps, procedures, and strategies taken to investigate the problem being studied and to analyse the collected data. The various components of research methodology are discussed under their respective headings which include: research design, research setting, target population, sampling technique, instrument for data collection, pilot study and reliability test, validity of the instrument, data collection method, data analysis, ethical consideration

3.1 Research Design

This study employs a descriptive cross-sectional research design to investigate knowledge and perception of AI among nurses at the University of Benin Teaching Hospital (UBTH). A cross-sectional design was particularly suited for this research as it allowed for the collection and analysis of data from a specific population at a single point in time, facilitating the assessment of knowledge and perception of AI without requiring a longitudinal study.

3.2 Research Setting

The setting used for this study is Benin City, Edo-State, Nigeria. Edo, sometimes referred to as Edo State, is a state in the Federal Republic of Nigeria's South-South geopolitical zone. The state has the 22nd highest population in Nigeria as of 2022. In 2022, the state is estimated to have

4,777,000 residents (NPC, 2022). Edo State has 34 State hospitals and 3 Federal health institutions. University of Benin Teaching Hospital (UBTH) will be sampled in this study.

UBTH is a prominent tertiary healthcare institution that serves as a referral center for various regions within and beyond Edo State. It is located in Benin City, Edo-State, Nigeria and was established on May 12th,1973. It has a bed capacity of over 900 and 36 departments and services. It is affiliated with the University of Benin. The hospital has multiple departments, including surgical wards, intensive care units, emergency services, and outpatient clinics, all of which are staffed by a diverse nursing workforce. The setting is relevant for this research as the hospital's high patient load and the physical demands on its nursing staff provide a critical context for studying the knowledge, perception and nurses role in the use of artificial intelligence.

3.3 Target Population

This is the group of individuals that the researcher wants to generalise the findings of the study to. The target population for this study includes all registered nurses working at UBTH who have been employed for the past 12 months. This group comprises nurses from various departments, covering different specialties such as surgery, emergency care, intensive care, etc.

Table 3.1 Population of nursing staff in different specialty areas

Specialty Areas	**Total number of nurses**
Accident and Emergency Unit A	58
Accident and Emergency Unit B	56
Surgical Unit	72
Obstetrics and gynaecology	70
Medicine Unit A	52
Medicine Unit B	67
Theatre Complex	63
Pediatrics	53
Clinic Unit A	41
Clinic Unit B	33
Total	**565**

Determination of Sample

This was done using Taro Yamane (1967) formula which is stated as below:

$n = N/1 + N(e^2)$

Where:

n = the sample size

N = the population size (total number of nurses in UBTH)

e = the margin of error (commonly set at 0.05 for a 95% confidence level)

N = 565

e = 0.05

Thus, $n = 565/1+ 565(0.05^2)$

n= 565/1+ 565 (0.0025)

n= 234

Adding an attrition of 10%;

10% × 234.= 23.4

234 + 23.4= 257.4

~257

3.4 Sampling Technique

The study participants were chosen using a stratified random sampling technique. Initially, the nursing staff was categorised according to their departments to guarantee representation in all hospital units, including high-risk areas like the ICU and surgical wards. From each stratum, a random sample of nurses was selected to participate in the study. This method was considered appropriate because it ensures that the sample is representative of the diverse nursing workforce at UBTH, thus enhancing the generalizability of the study findings. The specialty areas were treated as strata, and nurses were randomly selected from each stratum. In addition to this, proportionate sampling was used to get the number of nurses to be used in each ward

Table 3.2 Proportional Sampling Distribution of Nurses by Specialty Area

Specialty Areas	Total number of nurses	Proportion
Accident and Emergency Unit A	58	**26**
Accident and Emergency Unit B	56	**26**
Surgical Unit	72	**33**

Obstetrics and gynaecology	70	**31**
Medicine Unit A	52	**23**
Medicine Unit B	67	**31**
Theatre Complex	63	**28**
Pediatrics	53	**23**
Clinic Unit A	41	**18**
Clinic Unit B	33	**15**
Total	**565**	**257**

3.4.1. Inclusion Criteria:

This is the population that met the criteria to be subjects of the study and they include Registered nurses with a minimum of one year of work experience at UBTH, nurses with active employment and those available during the data collection period, nurses who voluntarily consented to participate in the study

3.4.2. Exclusion Criteria:

These are the population that did not meet the criteria to be subjects of the study and they include nurses on extended leave (e.g., maternity, medical leave), nurses not directly involved in patient

care (e.g., educators, administrators), pregnant and postpartum nurses and those who are not willing to participate in the study.

3.5 Instrument for Data Collection

Data was collected using a self-structured questionnaire developed based on the study's objectives. The questionnaire was divided into four sections. Section A on Socio-Demographic which will gather data on participants' age, gender, years of experience, specialty area, and other relevant personal and professional characteristics, Section B on Knowledge of Artificial Intelligence, Section C on Perception of Nurses towards Artificial Intelligence, and Section D explored the nurses' role in the use of artificial intelligence. The questionnaire used a combination of Likert scales, multiple-choice questions to capture quantitative data.

3.6 Reliability of the Instrument

A pilot study was conducted with a small sample of 28 nurses who were not included in the final study. The purpose of the pilot study was to test the feasibility of the data collection process, identify any issues with the questionnaire items, and estimate the time required to complete the questionnaires. Feedback from the pilot study participants was then used to refine the questions and improve the overall clarity and flow of the questionnaire.

A reliability test was conducted using Cronbach's alpha to assess the internal consistency of the questionnaires. A Cronbach's alpha coefficient of 0.70 or higher was considered acceptable for establishing the reliability of the instrument. The reliability test results were analysed to ensure that the questionnaire items consistently measure the same construct and produce stable and consistent results over repeated administrations.

3.7 Validity of Instruments

To ensure the validity of the instruments used in this study, the content validity of the questionnaires was established through expert review. The questionnaires were reviewed by a panel of experts in informatics and nursing to ensure that the questions adequately covered all relevant aspects of practice. The experts provided feedback on the clarity, relevance, and comprehensiveness of the items, leading to revisions where necessary to improve the instruments' validity. Additionally, construct validity was assessed by correlating the questionnaire outcomes with known indicators of AI, ensuring that the instruments accurately measured the intended constructs.

3.8 Method of Data Collection

Data was collected during a four-week period. The questionnaires were distributed to the selected nurses during their shifts, after the introduction of the topic and participants had enough time to complete them. Research assistants were present to provide help and answer any questions, ensuring that participants completely comprehend the items. The completed questionnaires were collected and securely stored for data input and analysis.

3.9 Method of Data Analysis

The data collected was entered into Statistical Package for Social Sciences (SPSS) software version 26 for analysis. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarise the demographic characteristics of the respondents, the prevalence of WRMSDs, and the levels of ergonomic awareness and practice. Inferential statistics, such as Chi-square tests and Pearson's correlation coefficients, were also used to

explore the relationships between knowledge and perception of AI. A p-value of less than 0.05 was considered statistically significant, indicating a meaningful relationship between the variables.

3.10 Ethical Consideration

The study received ethical approval from the Ethics Committee of UBTH before data collection commenced and all participants were fully informed about the study's purpose, procedures, and potential risks and benefits. Written informed consent was also obtained from each participant, ensuring that participation will be voluntary and that participants could withdraw from the study at any time without consequence. Confidentiality was preserved by anonymizing the data, and only aggregated results were shared to protect participants' privacy. Throughout the research process, the study respected the ethical principles of beneficence, non-maleficence, autonomy, and justice. Plagiarism was also avoided by properly citing all authors both in the body of the paper and on the reference page. The study also evaluated ethical issues like debriefing, informed consent, and privacy. A copy of the ethical approval certificate is added to the appendix.

CHAPTER FOUR

DATA ANALYSIS, TESTING OF HYPOTHESIS AND ANSWERING OF RESEARCH QUESTIONS

4.0 Introduction

The data analysis, hypothesis testing and answering of the research questions were done in this chapter using responses obtained from the questionnaires administered to nurses working in selected wards at the University of Benin Teaching Hospital, Benin City, Edo State. A total of 257 questionnaires distributed to the respondents were duly filled and returned, this is 100% response rate.

4.1 Data Analysis

This data analysis is presented in this section such that the demographic variables were presented first before the research objectives were looked into, followed by the hypothesis testing.

4.2 Demography of Respondents

The demographic variables that pertained to this study and which the questionnaires assessed were age, level of education, marital status and years of experience. Table 4.1 shows the demographic distribution of the respondents with respect to the afore-listed demographic variables.

Table 4.1: Demographic Information of Respondents

S/N	Variables	Attributes	Frequency	Percent (%)
1.	Age	21-25 years	27	10.5
		26-30 years	50	19.5
		31-35 years	58	22.5
		36 – 40 years	52	20.2
		41 – 45 years	30	11.7
		46 – 50 years	20	07.8
		51 years and above	20	07.8
2.	Academic Qualification	RN	27	10.5
		RN & RM	50	19.5
		BNsc	100	38.9
		M.Nsc	70	27.2
		Phd	10	3.9
3.	Marital Status	Single	77	30
		Married	150	58.4
		Divorced	20	7.8
		Widowed	10	3.9
4.	Years of practice	1 – 5 years	50	19.5
		6 – 10 years	100	38.9
		11-15 years	70	27.2
		16-20 years	27	10.5
		20 years and above	10	3.9

Table 4.1 showed that 27 (10.5%) are between 21 and 25 years old, 50 (19.5%) are between 26 and 30 years old, 58 (22.5%) are between 31 and 35 years old while 20 (7.8%) of the respondents are 51 years and above. In terms of academic qualification, 27 (10.5%) of the respondents had RN, 50 (19.5%) had RN & RM, 100 (38.9%) had BNsc, 70 (27.2%) had M.NSc while 10(3.9%) had Phd. The marital status of the respondents showed that 77 (30%) of the respondents are single, 150 (58.4%) are married while 20 (7.8%) are divorced and 10(3.9%) are widowed. The distribution of the respondents in terms of years of practice showed that 50 (19.5%) have practiced for 1-5 years, 100 (38.9%) have practiced for 6-10 years, 70(27.2%) have practiced for 11-15 years, 27(10.5%) have practiced for 16-20 years while 10 (3.9%) have practiced for 20 years and above.

4.3 Analysis of Study Objectives

Knowledge of AI among Nurses in UBTH

Tables 4.2 contain responses from respondents as regards their knowledge of AI among Nurses in UBTH.

Table 4.2: Respondents' level of knowledge

S/N	ITEMS	CORRECT RESPONSE F (%)	INCORRECT RESPONSE F (%)
1	What is Artificial Intelligence (AI)?	206 (80.2%)	51 (19.8%)
2	Which of the following is an example of AI application in healthcare?	156 (60.7%)	101 (39.3%)
3	Which area can AI support nurses the most?	200 (77.8%)	57 (22.2%)
4	Which of these technologies is commonly used in AI systems?	210 (81.7%)	47 (18.3%)

5	What is a major goal of integrating AI into nursing care?	198 (77%)	59 (23%)
6	What is a major goal of integrating AI into nursing care?	180 (70%)	77 (30%)
	Mean	191 (74.3%)	66 (25.7%)

As can be seen in table 4.2 above, the majority 206 (80.2%) of the respondents gave the correct definition of AI while 51 (19.8%) of the respondents gave the wrong definition of AI. Response to item 2 showed that 156 (60.7%) of the respondents know the primary cause of AI while 101 (39.3%) indicated otherwise. Majority of the respondents representing 200 (77.8%) reported that automated documentation and patient monitoring while 57 (22.2%) reported otherwise. In the same way, the majority of the respondents reported correct responses to items 4, 5 and 6 in table 4.2 while only a few had incorrect responses.

The mean percentage of correctly answered items by the respondents as computed in table 4.2 was 191 (74.3%) and that of incorrectly answered questions was found to be 66 (25.7%). Comparing the mean percentages with the McDonald's standard of learning outcome measure criteria

Level of Knowledge	composite of scores (%)
Very low	< 60%
Low	60 – 69.99%
Moderate	70 – 79.99%
High	80 – 89.99%
Very high	90 – 100%

Therefore, the result, 74.3% of the respondents exhibiting correct knowledge of AI in comparison with the McDonald's scale indicates a moderate level of knowledge regarding AI. Therefore, the respondents can be said to have a moderate level knowledge of AI.

Table 4.3: Perception Of AI among Nurses

S/N	ITEMS	SA	A	D	SD	Mean
1	AI will improve the quality of patient care.	15 5.8%	31 12.1%	196 76.3%	15 5.8%	2.43
2	AI may replace some nursing roles in the future.	200 77.8%	40 15.6%	10 3.9%	7 2.7%	2.67
3	AI will reduce nurses' workload.	20 7.8%	30 11.7%	187 72.8%	20 7.8%	2.30
4	AI will require nurses to develop new skills.	196 76.3%	31 12.1%	15 5.8%	15 5.8%	3.60
5	I feel comfortable about the integration of AI in nursing	187 72.8%	30 11.7%	20 7.8%	20 7.8%	3.50
6	AI could compromise patient privacy and data security.	200 77.8%	40 15.6%	10 3.9%	7 2.7%	2.67
7	AI may not fully understand the emotional needs of patients.	187 72.8%	20 7.8%	30 11.7%	20 7.8%	2.65
	Overall Mean					2.8

Table 4.3 above contains respondents' perception of AI among nurses. From item 1 in table 4.4 above, 196 (76.3%) of the respondents strongly disagreed that AI will improve the quality of patient care, 15(5.8%) disagreed, 31(12.1%) agreed while 15(5.8%) strongly agreed. The mean response of the respondents to item 1 is 2.43 which is less than the average of 2.50 for a 4-point Likert scale, hence indicating the respondents generally disagree with item 1 which states "AI will improve the quality of patient care". In the same way, the mean responses from the respondents as regards to items3 and 8 in table 4.4 were found to be less than 2.50, thus suggesting that the respondents generally disagreed with the items in the table. The mean responses to items 2,4.5,6 and 7 in table 4.4 were found to be more than 2.50, thus suggesting

that the respondents generally agreed with the items. The overall mean response to all the items is greater than 2.50 thus the respondents have a good perception of AI.

Roles of Nurses in the Use of AI in Nursing Practice

Tables 4.4 contain responses from respondents as regards Roles of Nurses in the Use of AI in Nursing Practice

S/N	ITEMS	SA	A	D	SD	Mean
1	Nurses should be involved in the planning and implementation of AI systems.	196 76.3%	31 12.1%	15 5.8%	15 5.8%	2.53
2	Nurses should advocate for ethical use of AI in healthcare.	200 77.8%	40 15.6%	10 3.9%	7 2.7%	2.67
3	Nurses should help evaluate the effectiveness of AI tools in practice	20 7.8%	30 11.7%	187 72.8%	20 7.8%	2.30
4	AI should be seen as a tool to support, not replace, nursing care.	196 76.3%	31 12.1%	15 5.8%	15 5.8%	3.60
5	I am willing to learn and adapt to AI technologies in my work.	187 72.8%	30 11.7%	20 7.8%	20 7.8%	3.50
6	Continuous education and training on AI are essential for nurses.	200 77.8%	40 15.6%	10 3.9%	7 2.7%	2.67

Table 4.4 above contains respondents' Roles of Nurses in the Use of AI in Nursing Practice . From item 1 in table 4.4 above, 196 (76.3%) of the respondents strongly agreed that nurses should be involved in the planning and implementation of AI systems, 15(5.8%) disagreed, 31(12.1%) agreed while 15(5.8%) strongly disagreed. The mean response of the respondents to item 1 is 2.53 which is greater than the average of 2.50 for a 4-point Likert scale, hence

indicating the respondents generally agrees with item 1 which states “Nurses should be involved in the planning and implementation of AI systems”. In the same way, the mean responses from the respondents as regards to item 3 in table 4.4 were found to be less than 2.50, thus suggesting that the respondents generally disagreed with the item in the table. The mean responses to items 2,4.5 and 6 in table 4.4 were found to be more than 2.50, thus suggesting that the respondents generally agreed with the items.

4.4 Test of Hypothesis

The researcher used analysis of Chi-square statistics to test the stated hypothesis at a significance level of 0.05. The decision rule was based on the p-value that is associated with the chi-square test. Thus, if the p-value is less than 0.05 (significance level), accept the null hypothesis (H_0) but if the p-value is greater than 0.05, reject H_0.

The following hypothesis was tested using Chi-square statistics:

H_0: There is no significant relationship between knowledge and perception of artificial intelligence among nurses

H_1: There is a significant relationship between knowledge and perception of artificial intelligence among nurses

Table 4.5: Showing the relationship between the knowledge and perception of artificial intelligence among nurses.

		Knowledge of Nurses		Chi-square value (χ^2)	p-value
		Positive	Negative		
1	Perception				
	Positive	196	71	21.521	0.100
	Negative	200	57		

The result of the hypothesis testing revealed that the p-value associated with the test is more than 0.05 (significant level), hence the rejection of the null hypothesis. We therefore conclude that there is a significant relationship between the knowledge and perception of artificial intelligence among nurses in UBTH, Benin city.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter provides the discussion of findings, implications for nursing, summary, conclusion, recommendation, and suggestion for further studies.

5.1 Discussion of findings

Level of knowledge of artificial intelligence among nurses in UBTH.

Study findings in respect to objective one revealed that the majority 74.3% of the respondents exhibited correct knowledge of AI. Hence, the respondents have moderate knowledge of AI. In line with the findings of this study, an earlier study done by Attia et al., (2023) revealed that nurses had fair knowledge of AI. Abbas et al, (2019) in their study also revealed that nurses have adequate knowledge of AI contrast with a study by Oletunde et al., (2021) which revealed that nurses had poor knowledge of AI.

Perception of AI among Nurses

Study findings in respect to objective two revealed that nurses have a good perception of AI. This is in line with a study by Manzoor et al., (2021) which revealed that nurses have a positive perception of AI. This is also in contrast with a study by Kashif et al., (2020) which revealed that nurses have a negative perception of AI.

Role of Nurses in the Use of AI

Study findings in respect to objective two revealed that the role of nurses in the use of artificial intelligence include involving in the planning and implementation of AI systems etc. This is in

line with Wesam et al., (2025) which state that nurses should be part of the installation and operating team of artificial intelligence.

There is no significant relationship between knowledge and perception of AI among nurses

The findings from this study revealed that there is a significant relationship between the knowledge and perception of AI among nurses in UBTH, Benin city. This is supported by Oletunde et al., (2021) which reported a significant relationship between knowledge and perception of AI among nurses in UBTH, Benin city. This means that as the knowledge increases, level of perception equally increases.

5.2 Limitations of the study

The limitations of the study include:

1. Unwillingness of respondents to give relevant information.
2. Inadequate finance for the researcher to carry out extensive research on the problem of study.
3. Shortage of time for the researcher to carry out extensive research on the problem of study.

5.3 Implications for Nursing

To Nursing Practice: As artificial intelligence (AI) becomes increasingly integrated into healthcare delivery, its impact on nursing practice is profound. The study highlights the necessity for nurses to possess a foundational knowledge of AI and its applications. Nurses who are knowledgeable and hold positive perceptions of AI are more likely to utilize AI-enabled tools effectively in clinical care, leading to improved diagnostic accuracy, better patient monitoring, and enhanced decision-making processes. Furthermore, the introduction of AI technologies is

poised to redefine nursing roles. While AI can automate routine and administrative tasks, it cannot replace the core humanistic elements of nursing, such as empathy, emotional support, and holistic care. This shift allows nurses to focus more on patient-centered interactions, reinforcing their essential role in delivering compassionate care.

Additionally, ethical and legal considerations must be addressed in practice. Nurses must understand issues related to patient data privacy, consent, algorithmic bias, and the appropriate use of AI-generated recommendations. This knowledge is essential in ensuring that patient care remains safe and ethically sound. The implementation of AI also necessitates stronger interdisciplinary collaboration. Nurses will increasingly work alongside IT professionals, software developers, and data analysts, requiring them to develop communication and teamwork skills beyond the traditional healthcare framework. Finally, the study underscores the importance of involving nurses in policy formulation regarding the use of AI in healthcare. Their frontline insights are critical in ensuring that AI technologies are aligned with patient needs, clinical workflows, and professional values.

Nursing Research: In terms of nursing research, the study reveals a need for continued investigation into the role and impact of AI in nursing. There is a growing imperative to conduct empirical research on how AI tools influence patient outcomes, nurse satisfaction, and clinical efficiency. Evidence from such research can guide best practices and inform strategic decisions about AI adoption. Additionally, researchers should explore the barriers and facilitators to AI integration from the perspective of nurses. Understanding factors such as technological infrastructure, workplace readiness, training availability, and cultural acceptance is vital to creating effective implementation strategies.

Another critical area for research is the evaluation of AI applications across various nursing specialties. Studies that examine how AI supports roles in maternal health, critical care, oncology, and community health can provide valuable insights into how technology should be customized for specific contexts. Locally driven research is also essential to ensure that AI tools are culturally and contextually appropriate, particularly in regions such as Benin City, where health challenges and resource constraints may differ from those in more technologically advanced settings.

Nursing Education: Nursing education must evolve to prepare nurses for a technology-driven healthcare environment. One key implication of this study is the urgent need to integrate AI literacy into nursing curricula at both undergraduate and postgraduate levels. Courses should introduce students to the principles of AI, data interpretation, and digital health systems to equip them for future roles. Beyond the classroom, continuous professional development opportunities are essential for in-service nurses. Workshops, seminars, and online courses focusing on AI applications in nursing can bridge the knowledge gap and enhance clinical competence.

The use of AI-enabled simulation tools can also transform nursing education by offering realistic, interactive training scenarios that enhance critical thinking and decision-making. Additionally, there must be a strong emphasis on the ethical aspects of AI in nursing education. Students and practitioners alike need to be trained in the responsible use of AI, including maintaining patient autonomy, confidentiality, and understanding the limitations of AI technologies.

5.4 Summary

This study assessed knowledge and perception of AI among nurses in a Tertiary Health Facility in Benin City, Edo-State. A descriptive survey design was adopted in this study and the study's

population comprised of 257 nurses across selected wards in UBTH. Proportionate sampling technique was used. A self-structured questionnaire was used to get data from the respondents which was validated by the researcher's supervisor and yielded a reliability score of 0.81 during the pilot study. Descriptive statistics such as frequencies, percentage and means were used to analyze the data obtained while Chi-square statistics was used to test the stated hypotheses of the study. The major findings in this study are:

There is a moderate level of knowledge of A among nurses in UBTH.

The respondents have good perception of AI and involving in the planning and implementation of AI systems are some of the roles of nurses in the use of AI.

5.5 Conclusion

This study sheds light on the assessed knowledge, perception and nurses roles in the use of AI among nurses in a Tertiary Health Facility in Benin City, Edo-State. Nursing care is one of the major health care services that contribute significantly to the patient healing process. This study found that nurses in UBTH have moderate knowledge of AI. This study thus concluded that there is a fair knowledge, the respondents have good perception of AI and involving in the planning and implementation of AI systems are some of the roles of nurses in the use of AI.

5.6 Recommendations

Based on the findings and conclusion, the following recommendations are suggested:

Hospitals should perform periodic surveys on patients' needs, expectations and hospital so as to design the nursing care accordingly.

Nurses should be provided with in-service, in-house and on-the-job training in the fields of “AI” and “Roles of Nurses”, and those necessary arrangements be made accordingly.

5.7 Suggestion for Further Studies

It would be worthwhile to replicate this study using a larger sample including nurses from other hospitals in other states, particularly rural areas where there is limited availability of health institutions. This will broaden the overall understanding of the phenomena.

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APPENDIX I

DEPARTMENT OF NURSING SCIENCE
SCHOOL OF BASIC MEDICAL SCIENCE
UNIVERSITY OF BENIN
BENIN CITY

Dear Respondents,

I am an undergraduate student of the above University, Faculty and Department. I am currently carrying out a research titled "**NURSES' KNOWLEDGE, PERCEPTION AND ROLES REGARDING THE USE OF ARTIFICIAL INTELLIGENCE IN NURSING CARE IN A TERTIARY INSTITUTION, BENIN CITY** " This questionnaire is purely for academic purpose only. The information supplied will be administered only for the purpose of this study and will be treated with utmost confidentiality.
Thanks for your cooperation.

INSTRUCTION: Please tick (√√) where appropriate.

Section A: Socio-Demographic Data

Please tick (✓) the appropriate option.

1. **Age:**
   ☐ 20–29 ☐ 30–39 ☐ 40–49 ☐ 50 and above

2. **Gender:**
   ☐ Male ☐ Female

3. **Marital Status:**
   ☐ Single ☐ Married ☐ Divorced ☐ Widowed

4. **Highest Educational Qualification:**
   ☐ RN ☐ RN/RM ☐ BSc Nursing ☐ MSc Nursing ☐ Others (specify): _____

5. **Years of Experience in Nursing Practice:**
   ☐ Less than 5 years ☐ 5–10 years ☐ 11–15 years ☐ More than 15 years

6. **Department/Unit:** _____

7. **Have you ever received any training on Artificial Intelligence in healthcare?**
   ☐ Yes ☐ No

Section B: Knowledge of Artificial Intelligence

8. What is Artificial Intelligence (AI)?

☐ a) A human-like robot used only in industries
☐ b) Computer systems designed to perform tasks that normally require human intelligence
☐ c) Software used for accounting
☐ d) A type of social media platform

9. Which area can AI support nurses the most?

☐ a) Patient entertainment
☐ b) Automating documentation and patient monitoring
☐ c) Organizing hospital parties
☐ d) Manual housekeeping

10. Which of these technologies is commonly used in AI systems?

☐ a) Thermometers
☐ b) Artificial limbs
☐ c) Machine learning and data analysis algorithms
☐ d) X-ray films

11. What is a major goal of integrating AI into nursing care?

☐ a) To replace nurses
☐ b) To make nurses redundant
☐ c) To enhance decision-making and reduce errors
☐ d) To reduce the number of hospital beds

12. Which of the following is NOT a known benefit of AI in nursing care?

☐ a) Faster clinical decision-making
☐ b) Improved patient monitoring
☐ c) Increased emotional support from machines
☐ d) Reduced administrative burden

Perception Of AI among Nurses

S/N	ITEMS	SA	A	D	SD
1	AI will improve the quality of patient care.				
2	AI may replace some nursing roles in the future.				
3	AI will reduce nurses' workload.				
4	AI will require nurses to develop new skills.				
5	I feel comfortable about the integration of AI in nursing				
6	AI could compromise patient privacy and data security.				
7	AI may not fully understand the emotional needs of patients.				

Roles of Nurses in the Use of AI in Nursing Practice

S/N	ITEMS	SA	A	D	SD
1	Nurses should be involved in the planning and implementation of AI systems.				
2	Nurses should advocate for ethical use of AI in healthcare.				
3	Nurses should help evaluate the effectiveness of AI tools in practice				
4	AI should be seen as a tool to support, not replace, nursing care.				
5	I am willing to learn and adapt to AI technologies in my work.				
6	Continuous education and training on AI are essential for nurses.				

APPENDIX 11

CRONBACH ALPHA RESULT

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.810	.794	18

Cronbach's Alpha = 0.810