بسم الله الرحمن الرحيم

Merowe University of Technology

Facility of medicine and health

Program of:

Nursing

Proposal on:

From Human-Centered Care to Smart Care: Challenges and Opportunities of Nursing Practice in the Digital Era in Selected Hospitals, Merowe Locality, Northern State, Sudan (2026).

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1. Introduction

1.1Background

The global healthcare sector is undergoing a fundamental transformation as it transitions into the Digital Era. The rapid expansion of information and communication technologies (ICT) has reshaped traditional patient care models.

"Smart Nursing" has emerged as a transformative framework that integrates Artificial Intelligence (AI), machine learning, sensor technology, and big data analytics into nursing workflows. This shift aims to move care from reactive, in-person models toward continuous, predictive, and patient-centered approaches.

Within the context of Merowe Locality, hospitals like Merowe Medical City are positioning themselves to adopt these advancements through investments in continuous professional development and medical innovation.

1.2 Problem Statement

The rapid advancement of digital technologies has transformed healthcare delivery and created new opportunities to improve nursing care. Digital health technologies have the potential to enhance the quality, efficiency, and accessibility of nursing care. However, integrating these technologies into nursing practice remains a significant challenge.

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Several barriers affect the effective implementation of digital technologies in nursing care, including concerns about data security and patient privacy, limited organizational and infrastructural readiness, inadequate training and digital competencies among nurses, and the risk of reducing the human-centered aspect of nursing care. Furthermore, there is limited evidence regarding the effectiveness of digital technologies in improving nursing care, particularly in resource-limited settings such as Sudan.

Therefore, this study aims to assess nursing practice in the digital era among nurses working in selected hospitals in Merowe Locality, Northern State, Sudan, and to identify the factors influencing the integration of digital technologies into nursing care while maintaining patient-centered care.

1.3 Justification

Transitioning to Smart Care is a strategic necessity to restore the essence of nursing while improving patient safety. The integration of digital tools is justified by:

-Enhanced Patient Safety: AI-driven early warning systems can detect clinical deterioration hours earlier than traditional methods, potentially reducing unexpected events by up to 50%

-Reduced Administrative Burden.

-Sustainability & Efficiency: Digitalization improves resource allocation, reduces long-term healthcare costs, and enhances

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staff satisfaction and retention.

-Preserving Humanity: AI serves as an "intelligent partner" that enhances professional judgment rather than replacing it, ensuring human dignity and respect remain at the core of digital processes.

2.Research Question:

How can the transition from traditional human-centered care models to Smart Nursing practices, through the integration of digital technologies, enhance clinical efficiency and patient safety while preserving the human essence of care in selected hospitals in Merowe Locality (2026).

3.Research Objectives:

3.1General Objective:

To evaluate the transition from traditional human-centered care to "Smart Care" nursing practices in selected hospitals in Merowe Locality (2026).

3.2Specific Objectives:

1-To assess the infrastructural and organizational readiness of Merowe hospitals for digital technology integration.

2-To assess the digital competency and ethical awareness of nurses regarding digital health technologies.

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3-To determine the effectiveness of digital tools in reducing the administrative burden on nurses.

4- To identify the challenges and opportunities affecting the implementation of digital nursing practices in selected hospitals.

4-Materials and Methods:

4.1. Study Design:

descriptive cross-sectional study.

4.2. Study area:

Study conducted at selected hospitals in Merowe Locality، Northern State, Sudan.

4.3 Study period:

2 months

4.4. Study population:

Nurses who work at selected hospitals in merowe Locality.

4.5. Sampling size: (30)

-Such type of study follow convenient non propability sampling technique

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4.6. Data collection Tools and procedure:

Structured self-administered questionnaire.

Data presentation and analysis:

.Descriptive statistics (frequencies, percentages, and means) will be used to summarize the data.

Analytical statistics: Chi-square test or Fisher's exact test will be used to assess the association between categorical variables. A p-value of less than 0.05 will be considered statistically significant.

.5.Ethical Considerations:

Ethical approval will be obtained from the relevant Ethical Committee before the commencement of the study. Official permission will also be obtained from the administrations of the selected hospitals. Written informed consent will be obtained from all participants after explaining the purpose and objectives of the study. Participation will be voluntary, and participants will have the right to withdraw from the study at any time without any consequences. Confidentiality and anonymity of all participants will be strictly maintained, and the collected data will be used solely for research purposes.

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6. Expected Results:

The study is expected to reveal different levels of nurses' knowledge and practice regarding the use of digital technology in nursing care at selected hospitals in Merowe Locality. It is also expected that nurses who have received training or have more experience with digital systems will demonstrate better practice. The findings may identify barriers to the effective use of technology and provide recommendations to improve digital nursing practice and enhance the quality of patient care.

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