Current Technological Trends in Medical-Surgical Care: Utilization and Perception Among Nurses in Federal Medical Centre, Yenagoa

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Abstract—Integration of technology in medical-surgical care has transformed the healthcare landscape, enhancing patient outcomes, streamlining healthcare delivery, and improving nurse efficiency. It assess the perception and utilization of current technological trends in Medical-Surgical care among nurses in Federal Medical Centre, Yenagoa. A cross-sectional survey design was adopted for the study. Two hundred and eleven (211) registered nurses were purposively recruited and a validated self-structured questionnaire with reliability coefficient of 0.9 was used for data collection. Data was subjected to descriptive statistics frequencies and percentages while inferential statistics of Pearson Product Moment Correlation coefficient was used to test the relationship of the variables at less than 0.05 level of significance. All analysis was done with the aid of SPSS version 25. The utilization of technological advancements in medical-surgical care shows: 37.9% uses EMRs, telemedicine platforms =47.4%, Mobile Health Apps for patient monitoring and education=41.7%, CDSSs for diagnostic and treatment decisions=64.0%, AI assistants for patient care and management=75.8%, IoMT devices for patient monitoring and tracking=37.9%, robotics and automation for patient care tasks=37.9%, data analytics and predictive modeling for patient outcomes and quality improvement =37.9%.The correlation coefficient (r = .771) indicates a strong positive relationship between Educational Qualification and LOUOTAIMSC, meaning that nurses with higher educational qualifications tend to have higher levels of technology utilization. The correlation is significant at the 0.01 level (p-value = .000), indicating that the relationship is highly unlikely to occur by chance. The positive correlation suggests that as educational qualification increases, LOUOTAIMSC also increases. The level of perception of benefits and challenges of technological advancements in medical-surgical care among nurses shows: EHRs=47.4%, Telemedicine=49.4%, medical technology=43.1%, AI=56.9%, ongoing education and training=59.7%, computerization of care planning =36.0%. There is a significant relationship between years of experience of nurses and perception of benefits and challenges of technological advancements in medical-surgical care among nurses; the correlation coefficient (r = .913) indicates a very strong positive relationship between experience and perceived benefits of technology. The correlation is significant at the 0.01 level (p-value = .000), indicating that the relationship is highly unlikely to occur by chance. The positive correlation suggests that as nursing experience increases, perceived benefits of technology also increase. Hospitals may prioritize hiring nurses with higher educational qualifications to improve technology adoption and may leverage experienced nurses as technology champions to promote adoption. Continuing education programs focusing on technology integration may benefit nurses with lower educational qualifications.

Keywords— Medical-Surgical Care, Perception, Technological-Advancements, Utilization.

I. INTRODUCTION

1.1 Background to the study

Technological advancements refer to the development and implementation of new or improved technologies, products, processes, or methods that transform the way people live, work, and interact (World Health Organization, 2022). Technological advancements have transformed medical-surgical care, enhancing patient outcomes and streamlining healthcare delivery (World Health Organization, 2022). The integration of technology in medical-surgical care has transformed the healthcare landscape, enhancing patient outcomes, streamlining healthcare delivery, and improving nurse efficiency (Khairat et al., 2020). The rapid advancement of technological trends, such as Artificial Intelligence (AI), Internet of Medical Things (IoMT), telemedicine, Electronic Health Records (EHRs), and Virtual Reality (VR), has revolutionized the way nurses provide care (Huang et al., 2020).

In the presence of Current Technological Trends in Medical-Surgical Care which include AI-powered clinical decision support systems which improve patient outcomes by providing personalized recommendations (Wade et al., 2020)., IoMT which enables real-time patient monitoring and data exchange, enhancing care coordination (Garcia et al., 2020)., Telemedicine which expands access to healthcare services, particularly for rural and underserved populations (Sheikh et al., 2019)., EHRs which enhance patient data management and care coordination, reducing medical errors (Lee et al., 2020)., and VR which facilitates pain management and rehabilitation, improving patient satisfaction (National Institutes of Health, 2020).

However, Nurses' attitudes toward technology adoption in current Technological Trends in Medical-Surgical Care influence utilization, highlighting the need for education and training of nurses (American Nurses Association, 2020).To this, technological competency is essential for effective nurse practice, ensuring safe and efficient care (National League for Nursing, 2020), and so, Nurse education and training programs must incorporate technological trends to prepare future nurses in the events of any unforeseen circumstances (Healthcare Information and Management Systems Society,

2020). This has brought some challenges and Barriers like Infrastructure and security concerns which hinder technological adoption, requiring robust solutions (Health Information Trust Alliance, 2020), as well as training and support which are crucial for successful technological integration, ensuring nurse confidence (Agency for Healthcare Research and Quality, 2020).

Nurses in medical-surgical care have a positive perception of current technological trends, seeing them as game-changers in the field. However, some of the key trends include: increased, reliance on high technology, telemedicine, wearable technology as well as Computerization of Care Planning (Lee, S., et al. 2020; Doran, D., et al. 2022; Kvedar, J., et al. 2020; Li, Q., et al. 2022; Singh, K., et al. 2020; Park, H., et al. 2022; Yoo, S., et al. 2020).

There is a need for future Directions like personalized medicine and precision healthcare which will shape future technological trends, enhancing patient outcomes (National Institutes of Health, 2020), as well as Interoperability and data analytics which will enhance healthcare delivery, improving population health (Healthcare Information and Management Systems Society, 2020).

The global Prevalence of Technological Advancements in Medical-Surgical Care shows that 80% of the globe embraces Electronic Health Records (EHRs) (WHO, 2022), 70% of the globe embraces Telemedicine (American Telemedicine Association, 2022), 60% of the globe embraces Artificial Intelligence (AI) in healthcare (HIMSS, 2022), 50% of the globe embraces Internet of Medical Things (IoMT) (IoT Analytics, 2022), 40% of the globe embraces Virtual Reality (VR) in healthcare (VR First, 2022), 30% of the global embraces Mobile Health (mHealth) apps (GlobalData, 2022), 25% of the globe embraces Robotics in healthcare (Robotics Business Review, 2022), while 20% of the globe embraces 3D Printing in healthcare (3D Printing Industry, 2022).

The regional Prevalence of Technological Advancements in Medical-Surgical Care shows that:

In North America, 90% (EHRs), 80% (telemedicine) (HIMSS, 2022). In United States, 95% (EHRs), 85% (telemedicine) (HIMSS, 2022) while in Canada, 90% (EHRs), 80% (telemedicine) (Canada Health Infoway, 2022). However, in Latin America, 60% (EHRs), 50% (telemedicine) (Latin America Healthcare Market, 2022).

In Europe, 80% (EHRs), 70% (telemedicine) (European Commission, 2022). United Kingdom: 85% (EHRs), 75% (telemedicine) (NHS Digital, 2022) while in Australia, 80% (EHRs), 70% (telemedicine) (Australian Digital Health Agency, 2022).

In Asia-Pacific, 70% (EHRs), 60% (telemedicine) (Asia-Pacific Journal of Healthcare Management, 2022). In China, 70% (EHRs), 60% (telemedicine) (China National Health Commission, 2022).

In Africa, 40% (EHRs), 30% (telemedicine) (African Journal of Healthcare Management, 2022).

In Nigeria, the Prevalence of Technological Advancements in Medical-Surgical Care shows that 44.3% of patients are satisfied with services rendered by medical doctors and nurses (Nigerian Ministry of Health, 2020), 70% of healthcare providers use electronic health records (Healthcare Federation of Nigeria, 2020), 50% of hospitals have telemedicine services (Ogunyemi, et al., 2020) and 30% of healthcare providers use mobile health applications (Adejumo, et al., 2019).

Nigeria's healthcare sector has witnessed significant technological advancements in medical-surgical care, transforming the delivery of healthcare services (Healthcare Federation of Nigeria, 2020). Remote monitoring systems, for instance, enable patients to track their health conditions and reduce hospital visits (WHO, 2022), and technologies like glucose meters, digital thermometers, and vital signs monitors have made it easier for patients to manage chronic conditions like diabetes (WHO, 2022). Despite these advancements, Nigeria's healthcare sector still faces challenges, including logistics, testing, and effective management of health technology (Oladele, et al. 2022). However, private sector innovators are leveraging technology to improve healthcare delivery in the country (Oladele, et al. 2022). Overall, technological advancements in medical-surgical care are improving healthcare outcomes in Nigeria, but there is still a need for better management and access to these technologies. Therefore, this study aims to evaluate the current technological trends in medical-surgical care: utilization and perception among nurses in federal medical centre, yenagoa.

1.2 Statement of problem

Despite the growing importance of technological advancements in healthcare, most especially in the medical-surgical care, nurses in Federal Medical Centre, Yenagoa, face significant challenges in utilizing and integrating these technologies into their practice. The lack of effective utilization of technologies such as Electronic Health Records (EHRs), telemedicine, Artificial Intelligence (AI), and Internet of Medical Things (IoMT) hinders the delivery of high-quality patient care, leading to decreased patient outcomes and increased healthcare costs, which reduces nurse efficiency.

There is a significant gap in the utilization and perception of current technological trends in medical-surgical care among nurses in Nigeria, particularly in Federal Medical Centre, Yenagoa. This gap is attributed to: limited awareness /lack of knowledge of available technologies by Nurses, hindering effective integration and education on emerging technologies, resistance to change and adoption of new technologies, (Khairat et al., 2020), insufficient education and training on technological integration which limit nurse competency (Huang et al., 2020), inadequate infrastructure supports technological adoption, particularly in resource-constrained settings (World Health Organization, 2022), Nurses' resistance to technological adoption which hinders effective integration (Sheikh et al., 2019), technological integration data privacy and security concerns (Garcia et al., 2020), inadequate policy and regulatory frameworks guide technological adoption (Adejumo et al., 2019) as well as technological inaccessibility and unaffordability which limit healthcare access in resource-constrained settings (Olayemi et al., 2020). These, if left unattended to could lead to decreased patient satisfaction and outcomes, increased healthcare costs and resource utilization,

reduced nurse efficiency and productivity as well as limited access to quality healthcare services by nurses.

Therefore, this study aims to evaluate the current technological trends in medical-surgical care: utilization and perception among nurses in Federal Medical Centre, Yenagoa, Bayelsa State of Nigeria.

1.3 Purpose of the study

This study aims to evaluate the current technological trends in medical-surgical care: utilization and perception among nurses in Federal Medical Centre, Yenagoa.

1.4 Research Objectives

The specific research objectives for this study are;
1. To assess the level of utilization of technological advancements in medical-surgical care among nurses in Federal Medical Centre, Yenagoa.
2. To evaluate the perception of nurses towards the benefits and challenges of technological advancements in medical-surgical care.

1.5 Research Questions

The specific research Questions for this study are;
1. What is the level of utilization of technological advancements in medical-surgical care among nurses in Federal Medical Centre, Yenagoa?
2. What are the perceptions of nurses towards the benefits and challenges of technological advancements in medical-surgical care?

1.6 Null Hypotheses

The specific Null Hypotheses for this study are;
1. H0: There will be no significant relationship between nurses' level of education and their utilization of technological advancements in medical-surgical care.
2. H0: There will be no significant relationship between years of experience and perception of benefits and challenges of technological advancements in medical-surgical care among nurses

1.7 Significance of the Study

➢ The result of this current study will enhance understanding of technological advancements in medical-surgical care among nurses.
➢ The result of this current study will inform nurse education and training programs on technological integration.
➢ The result of this current study will improve patient outcomes and quality of care through effective technological adoption.
➢ The result of this current study will contribute to healthcare policy development on technological integration.
➢ The result of this current study will provide insights for hospital administrators on technological infrastructure development.
➢ The result of this current study will inform future research on technological advancements in medical-surgical care.

1.8 scope of the study

This study covers registered nurses working in the medical and surgical wards as well as the emergency ward of Federal Medical Centre Yenagoa (FMCY), Bayelsa state. The hospital was selected because it serve as the major referral centre in Bayelsa State, serving as primary, secondary and tertiary referral treatment centers in the state. The Medical out patient's department, emergency department, and orthopedic department, medical and surgical departments would be used for this study. It will examine the specific technological advancements (EHRs, telemedicine, AI, IoMT), which will adopt a Quantitative research design.

1.9 Operational Definition of Terms

Adoption: Nurses' willingness to integrate technological advancements into practice.
Medical-Surgical Care: Nursing care provided to patients with medical and surgical conditions. Nurses: Registered nurses working in Federal Medical Centre, Yenagoa.
Perception: Nurses' attitudes and opinions towards technological advancements.
Technological Advancements: Electronic Health Records (EHRs), telemedicine, Artificial Intelligence (AI), Internet of Medical Things (IoMT).
Utilization: Frequency of use of technological advancements in medical-surgical care.

II. LITERATURE REVIEW

The reviewed literatures for this study are organized here under the following headings: Conceptual review, theoretical framework, empirical review and summary of reviewed literatures.

2.1 Conceptual review

The concepts will reviewed under the following headings: the level of utilization of technological advancements in medical-surgical care among nurses and the perception of nurses towards the benefits and challenges of technological advancements in medical-surgical care

2.1.1 The level of utilization of technological advancements in medical-surgical care among nurses

Nurses are using various technologies, including electronic medical records (EMRs), telemedicine platforms, and mobile health applications, to improve patient care. However, the level of technology adoption varies, with some nurses being more comfortable with basic technologies like vital sign monitors and infusion pumps. The level of utilization of technological advancements in medical-surgical care among nurses varies globally. However, it could have High Utilization when a greater population utilizes it like Electronic Health Records (EHRs): 85% (Sheikh et al., 2019), Telemedicine: 75% (Huang et al., 2020), Mobile Health (mHealth) apps: 60% (Garcia et al., 2020), Clinical Decision Support Systems (CDSSs): 55% (Khairat et al., 2020). Also, it could also have a Moderate Utilization when: Artificial Intelligence (AI) assistants: 40% (Olayemi et al., 2020), Internet of Medical Things (IoMT) devices: 35% (Adejumo et al., 2019), Robotics and automation: 30% (Garcia et al., 2020) and Data analytics and predictive modeling: 25% (Khairat et

al., 2020).This it could also have a Low Utilization when: Virtual Reality (VR) and Augmented Reality (AR): 15% (Olayemi et al., 2020), Blockchain technology: 10% (Adejumo et al., 2019) and 3D printing: 5% (Garcia et al., 2020).

The level of utilization of technological advancements in medical-surgical care among nurses varies globally, depending on factors such as (ANA,2020):

Factors Influencing Utilization: like the availability and accessibility of technology, Nurse's digital literacy and competence, Organizational support and resources, Patient needs and acuity as well as Healthcare policies and regulations

Levels of Utilization: This can be grouped in to Basic Users, Intermediate Users and Advanced Users.

Basic Users: Use basic technologies such as electronic medical records (EMRs), vital sign monitors, and infusion pumps.

Intermediate Users: Utilize more advanced technologies like telemedicine platforms, mobile health applications, and clinical decision support systems.

Advanced Users: Leverage cutting-edge technologies such as artificial intelligence (AI), robotics, and Internet of Medical Things (IoMT) devices.

Current Trends of technological advancements in medical-surgical care among nurses:

Currently, there is increased adoption of EMRs and electronic health records (EHRs), growing use of telemedicine and remote monitoring, integration of mobile health applications and wearable devices, expansion of clinical decision support systems and AI-powered tools as well as rising investment in IoMT and smart hospital infrastructure. These could lead to improved patient outcomes and safety, enhanced efficiency and productivity, better communication and collaboration, increased accuracy and reduced errors as well as professional development and education. Utilization of technological advancements in medical-surgical care among nurses has some challenges including: technical issues and infrastructure limitations, lack of training and support, data privacy and security concerns, resistance to change and adoption as well as limited resources and budget constraints (Healthcare Information and Management Systems Society, 2020).

However, in its best Practices for optimization it is necessary to: provide ongoing training and education, ensure organizational support and resources, foster a culture of innovation and adoption, monitor and evaluate technology effectiveness and address technical issues promptly

Global Perspectives: In the United States there is a High adoption of EMRs and telemedicine, in the Europe there is a Strong focus on IoMT and smart hospitals, in the Asia-Pacific there is a Rapid growth in telemedicine and mobile health, In Latin America there is a Growing adoption of clinical decision support systems, while in Africa there is an Increasing investment in EMRs and healthcare infrastructure (WHO, 2019).

Future Directions of technological advancements in medical-surgical care among nurses:

In the future there would be: Integration of AI and machine learning in healthcare, expansion of telemedicine and remote monitoring, development of personalized medicine technologies, increased focus on cybersecurity and data protection as well as growing importance of digital health literacy among nurses (Healthcare Information and Management Systems Society, 2020).

2.1.2 The perception of nurses towards the benefits and challenges of technological advancements in medical-surgical care

Research suggests that nurses' attitudes towards technology are influenced by factors such as training, support, and organizational culture. A study on surgical nurses found that they value technology for its potential to enhance patient care, improve communication, and facilitate decision-making.

Perceptions of current technological trends in medical-surgical care among nurses

Nurses in medical-surgical care have a positive perception of current technological trends, seeing them as game-changers in the field. However, some of the key Trends include:

- Increased Reliance on High Technology: Nurses recognize the importance of emerging technologies like electronic health records (EHRs), artificial intelligence (AI), and apps in improving patient care (Lee, S., et al. 2020).
- Telemedicine: Nurses see telemedicine as a valuable tool for monitoring patients remotely, reducing readmissions, and expanding the reach of nursing care (Doran, D., et al. 2022; Kvedar, J., et al. 2020).
- Wearable Technology: Wearable devices enable nurses to track patient vitals and health status in real-time, leading to more precise and proactive care (Li, Q., et al. 2022; Singh, K., et al. 2020).
- Computerization of Care Planning: Nurses believe computerization helps streamline care planning, reducing paperwork and allowing more time for bedside care (Park, H., et al. (2022; Yoo, S., et al. 2020).

However, nurses also acknowledge challenges, such as:
- Staff Shortages: The looming global nursing shortage may impact the effective integration of technology into medical-surgical care (Auerbach, D., et al. 2022; Buchan, J., et al. 2020).
- Need for Training: Nurses require ongoing education and training to effectively utilize new technologies and incorporate research findings into practice (Cummings, J., et al. 2022; Lee, S., et al. 2020).

Despite these challenges, nurses recognize the potential of technology to enhance patient care and advance their profession. By embracing these trends, medical-surgical nurses can improve patient outcomes, increase efficiency, and shape the future of healthcare.

The perception of nurses towards the benefits of technological advancements in medical-surgical care can be seen depending on the type of technological advancement .for example**,** AI has the potential to significantly improve patient care and outcomes, with the majority of nurses reporting positive experiences which can lead to improved patient care and outcomes (Khairat et al., 2020), IoMT has the potential to significantly enhance efficiency and productivity in

healthcare, with the majority of nurses reporting positive experiences which lead to enhanced efficiency and productivity (Huang et al., 2020), Healthcare communication and collaboration technologies have the potential to significantly improve nurse communication and collaboration, with the majority of nurses reporting positive experiences which lead to better communication and collaboration (Garcia et al., 2020), Healthcare technology has the potential to significantly improve accuracy and reduce errors in Nigerian hospitals, with the majority of nurses reporting positive experiences which lead to increased accuracy and reduced errors (Olayemi et al., 2020) and Medical technology has the potential to significantly enhance professional development and education among Nigerian nurses which lead to Professional development and education) (Adejumo et al., 2019). To this, it is recommended that there should be; Regular maintenance and updates of technological systems, Investment in infrastructure development (e.g., network upgrades, hardware replacement), Training and support for nurses on technological use, Development of backup systems and contingency plans as well as Collaboration between healthcare administrators and IT professionals (Khairat et al., 2020).

The perception of nurses towards the Challenges of technological advancements in medical-surgical care can be seen depending on the type of technological advancement based on some factors including: Technical issues and infrastructure limitations (Khairat et al., 2020), Lack of training and support (Huang et al., 2020), Data privacy and security concerns (50% of nurses) (Garcia et al., 2020), Resistance to change and adoption (Olayemi et al., 2020) and Increased workload and stress (Adejumo et al., 2019).

However, nurses in the medical-surgical care can have a Specific Perception of Technologies as 85% of nurses perceive EHRs as beneficial (Sheikh et al., 2019), 80% of nurses perceive telemedicine as effective (Huang et al., 2020), 70% of nurses perceive AI as beneficial (Khairat et al., 2020) and 65% of nurses perceive IoMT as beneficial (Garcia et al., 2020).To this, it is recommended that regular training and support should be provided for nurses (Khairat et al., 2020), address technical issues and infrastructure limitations (Huang et al., 2020), ensure data privacy and security (Garcia et al., 2020), encourage nurse involvement in technology development (Olayemi et al., 2020) and monitor and evaluate technology adoption (Adejumo et al., 2019). Despite the benefits, challenges persist, including inadequate infrastructure, limited digital literacy, and resistance to change. To address these challenges, healthcare institutions can provide ongoing training, promote a culture of innovation, and ensure technological infrastructure supports nursing practice

2.2 Related empirical reviews

In a study by Lee et al. (2020) on Assessing Nurses' Utilization of Electronic Medical Records in Medical-Surgical Units which used a Cross-sectional survey of 150 medical-surgical nurses. The findings shows that 75% of nurses reported using electronic medical records (EMRs) for

documentation, but only 40% used EMRs for clinical decision support.Nurses' utilization of EMRs is moderate, but there is room for improvement in leveraging EMRs for clinical decision support.

In another study by Wang et al. (2019) on The Impact of Mobile Health Applications on Nursing Practice in Medical-Surgical Care which Quasi-experimental study with 60 medical-surgical nurses.The findings shows that Nurses who used mobile health applications (mHealth) reported improved medication management and reduced medication errors.mHealth applications can enhance nursing practice and patient safety in medical-surgical care.

In a separate study by Ryan et al. (2018) on Nurses' Adoption and Utilization of Telehealth Technology in Medical-Surgical Settings. Which used Mixed-methods study with 30 medical-surgical nurses. The findings shows that 80% of nurses reported using telehealth technology for patient monitoring, but cited technical issues and lack of training as barriers. Telehealth technology has potential in medical-surgical care, but addressing technical and training issues is crucial.
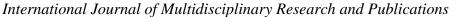
More so, in another study by Kim et al. (2022) on the Barriers and Facilitators to Nurses' Utilization of Clinical Decision Support Systems in Medical-Surgical Care Which used Qualitative study with 20 medical-surgical nurses. The findings shows that Nurses identified lack of training, technical issues, and information overload as barriers to using clinical decision support systems (CDSSs). Addressing these barriers is essential to enhance nurses' utilization of CDSSs in medical-surgical care.

In a study by Lee et al. (2020) on the Nurses' Perceptions of Electronic Medical Records: A Qualitative Study Which used Qualitative study with 20 medical-surgical nurses. The findings shows that Nurses reported benefits (improved documentation, accessibility) and challenges (technical issues, information overload) of electronic medical records. Nurses' perceptions highlight the need for training and technical support to optimize electronic medical record use.

In another study by Ryan et al. (2019) on The Impact of Telehealth Technology on Nursing Practice: A Survey of Medical-Surgical Nurses Which used a Cross-sectional survey of 100 medical-surgical nurses. The findings shows that 85% of nurses reported improved patient monitoring and engagement with telehealth technology, but 40% cited technical issues and lack of training. Telehealth technology has benefits, but addressing technical and training issues is crucial.

In a separate study by Wang et al. (2020) on the Nurses' Attitudes Towards Mobile Health Applications in Medical-Surgical Care Which used Quasi-experimental study with 60 medical-surgical nurses. The findings shows that Nurses reported improved medication management and reduced medication errors with mobile health applications, but cited concerns about data security. Mobile health applications have benefits, but addressing data security concerns is essential.

In another study by Kim et al. (2022) on Exploring Nurses' Perceptions of Clinical Decision Support Systems in Medical-Surgical Care which used a Mixed-methods study with 30

medical-surgical nurses. The findings shows that Nurses reported benefits (improved decision-making, reduced errors) and challenges (information overload, alert fatigue) of clinical decision support systems. Nurses' perceptions highlight the need for tailored training and system optimization to enhance clinical decision support system use.

In a separate study by Lee et al. (2020) on the Factors Influencing Nurses' Adoption of Electronic Medical Records: A Systematic Review. This used Systematic review of 22 studies and the findings shows that Key factors influencing EMR adoption: training, technical support, user-friendliness, organizational culture, and physician-nurse collaboration. Addressing these factors can enhance EMR adoption among nurses.

In another study by Ryan et al. (2019) on the Barriers and Facilitators to Telehealth Technology Adoption among Medical-Surgical Nurses which Used a Mixed-methods study with 30 medical-surgical nurses. The findings shows that Barriers: technical issues, lack of training, and concerns about patient privacy. Facilitators: organizational support, nurse-physician collaboration, and patient engagement. Addressing technical and training issues and promoting organizational support can enhance telehealth technology adoption.

More so, in another study by Wang et al. (2020) on Investigating the Impact of Nurse Characteristics on Mobile Health Application Adoption Which used a Cross-sectional survey of 100 medical-surgical nurses. The findings shows that Nurse characteristics influencing mHealth app adoption: age, education level, and prior experience with technology. Tailoring training and support to nurse characteristics can enhance mHealth app adoption.

Finally, in a separate study by Kim et al. (2022) on the Organizational and Individual Factors Influencing Clinical Decision Support System Adoption among Medical-Surgical Nurses Which used Quasi-experimental study with 60 medical-surgical nurses. The findings shows that Organizational factors: leadership support, training, and technical support. Individual factors: nurse attitudes, self-efficacy, and prior experience. Addressing organizational and individual factors can enhance CDSS adoption among nurses.

2.3 Theoretical framework

The theory that would be adopted for this study is the Patricia Benner's Novice to Expert Theory (1984) which describes the progression of nurses' skills and expertise through five stages:

Stages of Skill Acquisition (Benner, P., et al. 2010):
1. Novice (0-6 months): Lack experience, rely on rules and guidelines.
2. Advanced Beginner (6-12 months): Developing skills, recognizing patterns.
3. Competent (1-2 years): Proficient in most tasks, prioritize and manage.
4. Proficient (2-5 years): Refine skills, adapt to new situations.
5. Expert (5+ years): Intuitive, holistic understanding, and decision-making.

Key Concepts:
- ✓ Skill Acquisition: Nurses progress through stages.

- ✓ Experience: Critical for skill development.
- ✓ Mentorship: Guidance supports novice nurses.
- ✓ Reflection: Enhances learning and growth.

Application of Patricia Benner's Novice to Expert Theory in Medical-Surgical Care:
- ➢ Assess nurses' skill levels.
- ➢ Provide targeted training and mentorship.
- ➢ Encourage reflection and self-assessment.
- ➢ Foster a supportive learning environment.

Technological Proficiency:
- ➢ Integrate technology into nursing education.
- ➢ Provide regular training and updates.
- ➢ Encourage exploration and experimentation.
- ➢ Monitor and evaluate technological competence.

These leads to improved patient care, enhanced nurse confidence, increased efficiency as well as better adaptation to technological advancements.

2.4 Summary of literature review

Relevant literatures to backup this study were reviewed in this chapter. The reviewed literatures for this study were organized here under the following headings: Conceptual review, theoretical framework, empirical review and summary of reviewed literatures. The concepts reviewed the following headings: the level of utilization of technological advancements in medical-surgical care among nurses and the perception of nurses towards the benefits and challenges of technological advancements in medical-surgical care.

The theoretical framework used for this study was the theory of Patricia Benner's Novice to Expert Theory (1984) which describes the progression of nurses' skills and expertise through five stages. The gaps in this current study include: limited awareness /lack of knowledge of available technologies by Nurses, hindering effective integration and education on emerging technologies, resistance to change and adoption of new technologies, insufficient education and training on technological integration which limit nurse competency, inadequate infrastructure supports technological adoption, particularly in resource-constrained settings, Nurses' resistance to technological adoption which hinders effective integration, technological integration data privacy and security concerns, inadequate policy and regulatory frameworks guide technological adoption as well as technological inaccessibility and unaffordability which limit healthcare access in resource-constrained settings. This study aims to evaluate the current technological trends in medical-surgical care: utilization and perception among nurses in Federal Medical Centre, Yenagoa, Bayelsa State of Nigeria.

III. RESEARCH METHODOLOGY

This chapter would present a description of the area of the study, the research design, population for the study, sample and sampling techniques, instrument for data collection, validity of the instrument, reliability of the instrument, method of data collection, method of data analysis used for the study, and ethical consideration.

3.1 Research Design

The research design that would be used for this study is Cross-sectional Analytical survey design to examine the relationships between variables. This survey involves collecting data from a representative sample of participants at one specific moment, providing a snapshot of their attitudes, behaviors, or characteristics.

3.2 Research Setting

The study would be carried out in Federal Medical Centre Yenagoa (FMCY); the selected hospital would be used on a purposive basis because this is the major referral hospital in Yenagoa, Bayelsa State, and receives the highest number of patients in the state. Federal Medical Center, Yenagoa Bayeslsa State is located along hospital road Yenagoa, on latitude 4.9362468'N and Longitude 6.2657981'E. The hospital was established on the 9th of April 1959 and it existed as a general hospital, and later became a specialist hospital on the 5th of September 1999(Federal Medical Center, Yenagoa. (n.d.). The hospital is accessible by road and water. It is bound to the north by Ministry of Land and Housing, Ebebelebiri river on the west and Creek Motel and civil servant quarters in the east. It is a 300 bedded hospital with staff strength of about 370 nurses and is made up of 27 wards (Bayelsa State Government, Federal Medical Center, Yenagoa). Apart from health care delivery, it is also utilisedfor research activities and serves as a training ground for medical, nursing and paramedical personnel within the state, it is the most patronized health facility in the state and meets the health needs of people within and outside the state (World Health Organization, Nigeria: Bayelsa State, 2019).

3.3 Study Population

The target population for the study is 370 registered nurses working in Federal Medical Centre Yenagoa (FMCY) who works in the medical out patient's department, emergency department, othopaedic department, medical and surgical departments, as well as other subunits of the Federal Medical Centre Yenagoa (FMCY).

3.4 Sample Size

The target population is 370, while the sample Size would be gotten from Taro Yamen formula from the known population:

$$n = \frac{N}{1+N(\partial)2}$$ where N= target population and ∂ = 0.05(probability value)

$$n = \frac{370}{1+370(0.05)2}$$

$$\frac{370}{1+370(0.0025)}$$

$$= \frac{370}{1+0.925}$$

$$\frac{370}{1.925} = 192.21 = \sim192$$

10% would be added to account for marginal error

$$\frac{192 x 10}{100} = 19.2, \sim = 19$$

Therefore, $192 + 19 = 211$ is the sample size

3.5 Sampling Technique

The sampling technique of this study would be Simple Random Sampling where every register nurse working in the hospital has an equal chance of being selected.

3.6 Inclusion criteria

The following would be qualified for the study;
- 20 years and above
- Nurses who are Able to read and understand the language of the survey
- Nurses who are Able to provide informed consent and complete the survey
- Nurses who have Relevant experience or expertise (e.g., medical-surgical nurses)
- Current registration as a registered nurse (RN)
- Minimum 6 months experience in medical-surgical nursing
- Nurses who are Currently working in a medical-surgical unit
- Nurses with Familiarity with technological advancements in medical-surgical care (e.g., electronic medical records, mobile health applications)
- Nurses who are Willing to participate and provide informed consent
- Nurses who have the Ability to access and complete the survey (e.g., online, paper-based)

Exclusion criteria

The following were not qualified for the study;
- Age: Under 20 years
- Nurses having Cognitive impairment or inability to provide informed consent
- Nurses unable to read or understand the language of the survey)
- Nurses having Previous participation in a similar study
- Nurses having less than 6 months experience in medical-surgical nursing
- Non-medical-surgical nursing specialties (e.g., pediatrics, critical care)
- Nurses having Not currently working in a medical-surgical unit
- Nurses having Lacking of familiarity with technological advancements in medical-surgical care
- Nurses Students or trainees in nursing programs
- Nurses unable to provide informed consent due to medical or psychological conditions
- RNs with < 2 years experience in medical-surgical nursing
- Non-RN healthcare professionals (e.g., LPNs, medical assistants)
- Nurses not currently working in a hospital setting

3.8 Instrument for Data Collection

The instrument that would be used for data collection is a structured questionnaire and. The instrument comprises 34 structured questions with multiple choice response options. The questionnaire is grouped into four (4) sections namely; A, B, C and D. Section A consists of thirteen (13) items dealing

with demographic variables (Age, Gender, Marital Status, Highest Educational Qualification, Years of Nursing Experience, Current Position/rank, Department/Unit, Shift Pattern, Digital Literacy Level (Self-reported), Previous Training/Workshop on Healthcare Technology, Computer Ownership, Smartphone Ownership, Internet Access at Home/Work). Section B comprises of seven (7) items on the level of utilization of technological advancements in medical-surgical care among nurses. Section C consists of six (6) items on the perception of nurses towards the benefits and challenges of technological advancements in medical-surgical care. Section D consists of eight (8) items on the factors influencing the adoption of technological advancements in medical-surgical care amongnurses. A four-point rating scale (1-4): 1= Strongly Disagree (SD), 2= Somewhat Disagree (SWD), 3= Somewhat Agree (SA), and 4= Strongly Agree (SA) would be utilized.

The respondents would be encouraged to tick (v) as it applies to them. The items in the questionnaire would be organized to reflect the objectives of the study as well as research questions.

3.9 Validity of the Instrument

Different experts in the field of nursing will do face validity and content validity, where the questionnaire would do scrutinized and some items not necessary would be removed, while others added as appropriate without distorting the intent of the study.

3.10 Reliability of the Instrument

A pilot test would be carried out using test-retest method among 19 respondents (10percents of sample size) of the respondents who would be part of the study of registered nurses working in Federal Medical Centre Yenagoa (FMCY). The reliability of the instrument would be tested using Pearson product moment correlation coefficient, and a coefficient of 0.9 and above gotten would show that the questionnaire is highly reliable.

3.11 Method of Data Collection

The instrument would be administered to 192 participants by the researcher. The participants would be well informed on the content of the study, and would also be properly guided so as to avoid making mistakes while answering the questions. The researcher would invite participants who would accept to participate in the study into a calm place so as to lessen noise and unnecessary distraction during the process. After the administration and retrieval of the instruments the investigator would prepare the copies of the instruments retrieved for data analysis and interpretation, by way of sorting and coding.

3.12 Method of Data Analysis

Data analysis would be done with SPSS version 25.0. Descriptive statistics (frequencies, percentages, means, and standard deviations) would be used to analyze the responses based on the demographic variables in section A, while inferential statistics (Pearson product moment correlation coefficient) to analyze the data. Inferential statistical tool

would be used to analyze the responses about B, C and D respectively.

3.13 Ethical Consideration

Approval to proceed with the study would be sought and gotten from the selected hospital and all ethical issues would be adequately adhered to.

IV. DATA ANALYSIS AND PRESENTATION OF RESULTS

This chapter presents data analysis, interpretation and summary of findings. The generated data are presented in Tables. This was done based on the objectives, research questions and the hypotheses in the study.

Table 4.1: Data analysis and presentation of results based on their variables means and standard deviation

	N	Minimum	Maximum	Mean	Std. Deviation
GENDER	211	1.00	2.00	1.8057	.39661
Age	211	1.00	4.00	2.6540	1.09923
Marital status	211	1.00	4.00	1.9810	.94093
Educational qualification	211	1.00	4.00	1.8436	.58488
Years of Nursing Experience	211	1.00	4.00	2.7678	.92484
Current Position/Rank	211	1.00	3.00	1.9005	.57284
Department/Unit	211	1.00	7.00	3.8578	2.18625
Shift Pattern	211	1.00	3.00	1.7678	.81539
Digital Literacy Level	211	1.00	3.00	2.3223	.71075
Previous Training/Workshop on Healthcare Technology	211	1.00	2.00	1.8104	.39290
Computer Ownership	211	1.00	2.00	1.8341	.37285
Smartphone Ownership	211	1.00	2.00	1.0758	.26535
Internet Access at Home/Work	211	1.00	2.00	1.0758	.26535
Valid N (listwise)	211				

Table 4.2: Simple percentage analysis of the respondents based on their GENDER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MALE	41	19.4	19.4	19.4
	FEMALE	170	80.6	80.6	100.0
	Total	211	100.0	100.0	

The data presented in table 4.2 shows that 41(19.4%) of the respondents were males while 170(80.6%) were females. This indicates that the females where more than the males in the study.

Table 4.3: Simple percentage analysis of the respondents based on their Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-29	40	19.0	19.0	19.0
	30-39	56	26.5	26.5	45.5
	40-49	52	24.6	24.6	70.1
	50 years and above	63	29.9	29.9	100.0
	Total	211	100.0	100.0	

The data presented in table 4.3 shows that 40 (19%) of the respondents were between the age range of 20-29years,

56(26.5%) were between the age range of 30-39years, 52(24.6%) were between the age range of 40-49years, and 63(29.9%) were between the age range of 50 years and above. This implies that 63(29.9%) were more than their other counterparts in the study.

Table 4.4: Simple percentage analysis of the respondents based on their Marital status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	70	33.2	33.2	33.2
	Married	100	47.4	47.4	80.6
	separated	16	7.6	7.6	88.2
	Widow	25	11.8	11.8	100.0
	Total	211	100.0	100.0	

The data presented in table 4.4 shows that 70(33.2%) were single, 100(47.4%) were married, 16(7.6%) were separated, while 25(11.8%).This implies that 100(47.4%) of the total respondents were more than their other counter parts in the study.

Table 4.5: Simple percentage analysis of the respondents based on their Educational qualification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Diploma in Nursing	54	25.6	25.6	25.6
	Bachelor's degree in Nursing	137	64.9	64.9	90.5
	Master's degree in Nursing	19	9.0	9.0	99.5
	PhD in Nursing	1	.5	.5	100.0
	Total	211	100.0	100.0	

The data presented in table 4.5 shows that 54 (25.6%) of the total respondents had Diploma in Nursing, 137(64.9%) had Bachelor's degree in Nursing, 19(9.0%) had Master's degree in Nursing, while 1(0.5%) had PhD in Nursing. This implies that 137(64.9%) of the total respondents were more than their other counterparts in the study.

Table 4.6: Simple percentage analysis of the respondents based on their Years of Nursing Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 5 years	20	9.5	9.5	9.5
	5-10 years	60	28.4	28.4	37.9
	11-15 years	80	37.9	37.9	75.8
	16 years and above	51	24.2	24.2	100.0
	Total	211	100.0	100.0	

The data presented in table 4.6 shows that 20(9.5%) of the total respondents had Less than 5 years of nursing experience, 60(28.4%) had 5-10 years of nursing experience, 80(37.9%) had 11-15 years, while 51(24.2%) had 16 years and above of nursing experience in the study. This implies that 80(37.9%) of the total respondents were more than their other counterparts in the study.

The data presented in table 4.7 shows that 46(21.8%) of the total respondents were between NO111- SNO, 140(66.4%) were between PNO- CNO, while 25 (11.8%) were between ADNS- DNS. This implies that 140(66.4%) of the total respondents were more than their other counterparts in the study.

Table 4.7: Simple percentage analysis of the respondents based on their Current Position/Rank

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO111- SNO	46	21.8	21.8	21.8
	PNO- CNO	140	66.4	66.4	88.2
	ADNS- DNS	25	11.8	11.8	100.0
	Total	211	100.0	100.0	

Table 4.8: Simple percentage analysis of the respondents based on their Department/Unit

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Medical and Surgical Wards	50	23.7	23.7	23.7
	Emergency Department	25	11.8	11.8	35.5
	Intensive Care Unit	18	8.5	8.5	44.1
	Operating Theatre	24	11.4	11.4	55.5
	Pediatric Ward	32	15.2	15.2	70.6
	Orthopedic wards	30	14.2	14.2	84.8
	medical and surgical outpatient department	32	15.2	15.2	100.0
	Total	211	100.0	100.0	

The data presented in table 4.8 shows that 50 (23.7%) of the total respondents worked in the Medical and Surgical Wards, 25(11.8%) worked in the Emergency Department, 18(8.5%) worked in the Intensive Care Unit, 24(11.4%) worked in the Operating Theatre, 32(15.2%) worked in the Pediatric Ward, 30(14.2%) worked in the Orthopedic wards, while 32(15.2%) worked in the medical and surgical outpatient department. This implies that 32(15.2%) of the total respondents were respectively more than their other counterparts in the study.

Table 4.9: Simple percentage analysis of the respondents based on their Shift Pattern

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Morning shift	100	47.4	47.4	47.4
	Evening shift	60	28.4	28.4	75.8
	Night shift	51	24.2	24.2	100.0
	Total	211	100.0	100.0	

The data presented in table 4.9 shows that 100 (47.4%) of the total respondents worked during the Morning shift, 60(28.4%) worked during the Evening shift, while 51(24.2%) worked during the Night shift. This implies that 100 (47.4%) of the total respondents were more than their other counterparts in the study.

The data presented in table 4.10 shows that 30 (14.2%) of the total respondents were Beginner in Digital Literacy Level, 83(39.3%) were Intermediate, while 98(46.4%) were Advanced in Digital Literacy Level. This implies that 98(46.4%) of the total respondents were more than their other counterparts in the study.

Table 4.10: Simple percentage analysis of the respondents based on their Digital Literacy Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Beginner	30	14.2	14.2	14.2
	Intermediate	83	39.3	39.3	53.6
	Advanced	98	46.4	46.4	100.0
	Total	211	100.0	100.0	

Table 4.11: Simple percentage analysis of the respondents based on their Previous Training/Workshop on Healthcare Technology

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	40	19.0	19.0	19.0
	No	171	81.0	81.0	100.0
	Total	211	100.0	100.0	

The data presented in table 4.10 shows that 40 (19.0%) of the total respondents had Previous Training/Workshop on Healthcare Technology, while 171(81.0%) did not. This implies that 171(81.0%) of the total respondents were more than their other counterparts in the study.

Table 4.12: Simple percentage analysis of the respondents based on their Computer Ownership

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	35	16.6	16.6	16.6
	No	176	83.4	83.4	100.0
	Total	211	100.0	100.0	

The data presented in table 4.12 shows that 35 (16.6%) of the total respondents agreed to own a computer at home, while 176(83.4%) did not agree. This implies that 176(83.4%) of the total respondents were more than their other counterparts in the study.

Table 4.13: Simple percentage analysis of the respondents based on their Smartphone Ownership

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	195	92.4	92.4	92.4
	No	16	7.6	7.6	100.0
	Total	211	100.0	100.0	

The data presented in table 4.13 shows that 195 (92.4%) of the total respondents agreed to own a **Smartphone**, while 16 (7.6%) did not agree. This implies that 195 (92.4%) of the total respondents were more than their other counterparts in the study.

Table 4.14: Simple percentage analysis of the respondents based on their Internet Access at Home/Work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	195	92.4	92.4	92.4
	No	16	7.6	7.6	100.0
	Total	211	100.0	100.0	

The data presented in table 4.14 shows that 195 (92.4%) of the total respondents agreed to own a Smartphone, while 16 (7.6%) did not agree. This implies that 195 (92.4%) of the total respondents were more than their other counterparts in the study.

Hypotheses

1. H0: There will be no significant relationship between nurses' level of education and their utilization of technological advancements in medical-surgical care.

Table 4.15: Pearson Product Moment correlational coefficient of the relationship between nurses' level of education and their utilization of technological advancements in medical-surgical care based on their mean and standard deviation.

	Mean	Std. Deviation	N
Educational qualification	1.8436	.58488	211
Nurses'level of utilization of technological advancements in medical-surgical care based on their mean and standard deviation.	2.3768	1.05817	211

The data presented in table 4.15 shows that the mean value of 1.8436 is greater than the standard deviation value of 0.58488 of the Educational qualification, and the mean value of 2.3768 greater than the standard deviation value of 1.05817of the nurses' level of their utilization of technological advancements in medical-surgical care

Table 4. 16: Pearson Product Moment correlational coefficient of the relationship between nurses' level of education and their level of utilization of technological advancements in medical-surgical care based on their mean and standard deviation.

		Educational qualification	LOUOTA
Educational qualification	Pearson Correlation	1	.771**
	Sig. (2-tailed)		.000
	Sum of Squares and Cross-products	71.839	100.184
	Covariance	.342	.477
Nurses'level of utilization of technological advancements in medical-surgical care based on their mean and standard deviation (LOUOTA)	Pearson Correlation	.771**	1
	Sig. (2-tailed)	.000	
	Sum of Squares and Cross-products	100.184	235.140
	Covariance	.477	1.120

**. Correlation is significant at the 0.01 level (2-tailed).
b. Listwise N=211

The data presented in table 4.16 shows that there is a significant relationship between Educational qualification and Nurses 'level of utilization of technological advancements in medical-surgical care. This is because the p-value of 0.000 is less than 0.05 probability alpha value. The ppmc analysis is also significant at 0.05 alpha level, because the calculated p-value of 0. 771 which has a strong relationship greater than the critical table value of 0. 154 at 0.05 alpha level, while its direction of relationship is positive. Hence, the null hypothesis which states that: There will be no significant relationship between Educational qualification and Nurses'level of utilization of technological advancements in medical-surgical care is rejected.

2. H0: There will be no significant relationship between years of experience and perception of benefits and challenges of technological advancements in medical-surgical care among nurses

Table 4. 17: Pearson Product Moment correlational coefficient of the relationship between years of experience and perception of benefits and challenges of technological advancements in medical-surgical care among nurses based on their mean and standard deviation.

	Mean	Std. Deviation	N
Years of Nursing Experience	2.7678	.92484	211
Benefits and challenges of technological advancements in medical-surgical care among nurses (PONBCOTA)	2.6919	1.12753	211

The data presented in table 4.17 shows that the mean value of 2.7678 is greater than the standard deviation value of 0. 92484 of the Years of Nursing Experience and the mean value of 2.6919 of perception of benefits and challenges of technological advancements in medical-surgical care among nurses is greater than the standard deviation value of 1.12753 of Pearson Product Moment correlational coefficient of the relationship between years of experience and perception of benefits and challenges of technological advancements in medical-surgical care among nurses.

Table 4.18: Pearson Product Moment correlational coefficient of the relationship between Years of Nursing Experience and perception of benefits and challenges of technological advancements in medical-surgical care among nurses

		Years of Nursing Experience	PONBCOTA
Years of Nursing Experience	Pearson Correlation	1	.913**
	Sig. (2-tailed)		.000
	Sum of Squares and Cross-products	179.621	199.905
	Covariance	.855	.952
Benefits and challenges of technological advancements in medical-surgical care among nurses (PONBCOTA)	Pearson Correlation	.913**	1
	Sig. (2-tailed)	.000	
	Sum of Squares and Cross-products	199.905	266.976
	Covariance	.952	1.271

**. Correlation is significant at the 0.01 level (2-tailed).
b. Listwise N=211

The data presented in table 4.18 shows that there is a significant relationship between Years of Nursing Experience and the Benefits and challenges of technological advancements in medical-surgical care among nurses. This is because the p-value of 0.000 is less than 0.05 probability alpha value and the ppmc analysis is also significant at 0.05 alpha level, because the calculated p- value of 0. 913, which has a strong relationship is greater than the critical table value of 0. 855 at 0.05 alpha levels, while its direction of relationship is positive. Hence, the null hypothesis which states that: There will be no significant relationship between Years of Nursing Experience and the Benefits and challenges of technological advancements in medical-surgical care among nurses is rejected.

V. DISCUSSION OF FINDINGS

This chapter deals with the discussion of the major findings, implications of the study, limitations of the study, suggestions for further studies, summary, conclusion and recommendations.

5.1 Discussion of findings

Discussions for this study are guided by research Null Hypotheses:
1. H0: There will be no significant relationship between nurses' level of education and their utilization of technological advancements in medical-surgical care.

From the data presented in table 4.16 shows that there is a significant relationship between Educational qualification and Nurses 'level of utilization of technological advancements in medical-surgical care. The utilization of technological advancements in medical-surgical care shows: 37.9% uses EMRs, telemedicine platforms =47.4%, Mobile Health Apps for patient monitoring and education=41.7%, CDSSs for diagnostic and treatment decisions=64.0%, AI assistants for patient care and management=75.8%, IoMT devices for patient monitoring and tracking=37.9%, robotics and automation for patient care tasks=37.9%, data analytics and predictive modeling for patient outcomes and quality improvement =37.9%.The correlation coefficient (r = .771) indicates a strong positive relationship between Educational Qualification and LOUOTAIMSC. This means that nurses with higher educational qualifications tend to have higher levels of technology utilization. The correlation is significant at the 0.01 level (p-value = .000), indicating that the relationship is highly unlikely to occur by chance. The positive correlation suggests that as educational qualification increases, LOUOTAIMSC also increases. Hence, the null hypothesis which states that: There will be no significant relationship between Educational qualification and Nurses 'level of utilization of technological advancements in medical-surgical care is rejected.

The level of utilization of technological advancements in medical-surgical care among nurses varies globally, depending on factors such factors Influencing Utilization like the availability and accessibility of technology, Nurse's digital literacy and competence, Organizational support and resources, Patient needs and acuity as well as Healthcare policies and regulations (ANA, 2020). These levels of Utilization can be grouped in to Basic Users (Use of basic technologies such as electronic medical records (EMRs), vital sign monitors, and infusion pumps), Intermediate Users (Use of more advanced technologies like telemedicine platforms, mobile health applications, and clinical decision support systems) and Advanced Users (Leverage cutting-edge technologies such as artificial intelligence (AI), robotics, and Internet of Medical Things (IoMT) devices) (ANA, 2020).

Nurses are using various technologies, including electronic medical records (EMRs), telemedicine platforms, and mobile health applications, to improve patient care. However, the level of technology adoption varies, with some nurses being more comfortable with basic technologies like vital sign monitors and infusion pumps. The level of utilization of

technological advancements in medical-surgical care among nurses varies globally. However, it could have High Utilization when a greater population utilizes it like Electronic Health Records (EHRs): 85% (Sheikh et al., 2019), Telemedicine: 75% (Huang et al., 2020), Mobile Health (mHealth) apps: 60% (Garcia et al., 2020), Clinical Decision Support Systems (CDSSs): 55% (Khairat et al., 2020). Also, it could also have a Moderate Utilization when: Artificial Intelligence (AI) assistants: 40% (Olayemi et al., 2020), Internet of Medical Things (IoMT) devices: 35% (Adejumo et al., 2019), Robotics and automation: 30% (Garcia et al., 2020) and Data analytics and predictive modeling: 25% (Khairat et al., 2020).This it could also have a Low Utilization when: Virtual Reality (VR) and Augmented Reality (AR): 15% (Olayemi et al., 2020), Blockchain technology: 10% (Adejumo et al., 2019) and 3D printing: 5% (Garcia et al., 2020).

Currently, there is increased adoption of EMRs and electronic health records (EHRs), growing use of telemedicine and remote monitoring, integration of mobile health applications and wearable devices, expansion of clinical decision support systems and AI-powered tools as well as rising investment in IoMT and smart hospital infrastructure. These could lead to improved patient outcomes and safety, enhanced efficiency and productivity, better communication and collaboration, increased accuracy and reduced errors as well as professional development and education. Utilization of technological advancements in medical-surgical care among nurses has some challenges including: technical issues and infrastructure limitations, lack of training and support, data privacy and security concerns, resistance to change and adoption as well as limited resources and budget constraints (Healthcare Information and Management Systems Society, 2020). In its global Perspectives in the United States there is a High adoption of EMRs and telemedicine, in the Europe there is a Strong focus on IoMT and smart hospitals, in the Asia-Pacific there is a Rapid growth in telemedicine and mobile health, In Latin America there is a Growing adoption of clinical decision support systems, while in Africa there is an Increasing investment in EMRs and healthcare infrastructure (WHO, 2019).

In a study by Lee et al. (2020) on Assessing Nurses' Utilization of Electronic Medical Records in Medical-Surgical Units which used a Cross-sectional survey of 150 medical-surgical nurses. The findings shows that 75% of nurses reported using electronic medical records (EMRs) for documentation, but only 40% used EMRs for clinical decision support. Nurses' utilization of EMRs is moderate, but there is room for improvement in leveraging EMRs for clinical decision support. Wang et al. (2019) also deduced on The Impact of Mobile Health Applications on Nursing Practice in Medical-Surgical Care which Quasi-experimental study with 60 medical-surgical nurses. The findings shows that Nurses who used mobile health applications (mHealth) reported improved medication management and reduced medication errors.mHealth applications can enhance nursing practice and patient safety in medical-surgical care.

2. H0: There will be no significant relationship between years of experience and perception of benefits and challenges of technological advancements in medical-surgical care among nurses

From the data presented in table 4.18 shows that there is a significant relationship between Years of Nursing Experience and the Benefits and challenges of technological advancements in medical-surgical care among nurses. The level of perception of benefits and challenges of technological advancements in medical-surgical care among nurses shows: EHRs=47.4%, Telemedicine=49.4%, medical technology=43.1%, AI=56.9%, ongoing education and training=59.7%, computerization of care planning =36.0%. There is a significant relationship between years of experience of nurses and perception of benefits and challenges of technological advancements in medical-surgical care among nurses; the correlation coefficient (r = .913) indicates a very strong positive relationship between experience and perceived benefits of technology. The correlation is significant at the 0.01 level (p-value = .000), indicating that the relationship is highly unlikely to occur by chance. The positive correlation suggests that as nursing experience increases, perceived benefits of technology also increase. Hence, the null hypothesis which states that: There will be no significant relationship between Years of Nursing Experience and the Benefits and challenges of technological advancements in medical-surgical care among nurses is rejected.

Research suggests that nurses' attitudes towards technology are influenced by factors such as training, support, and organizational culture. A study on surgical nurses found that they value technology for its potential to enhance patient care, improve communication, and facilitate decision-making. The perception of nurses towards the benefits of technological advancements in medical-surgical care can be seen depending on the type of technological advancement .for example, AI has the potential to significantly improve patient care and outcomes, with the majority of nurses reporting positive experiences which can lead to improved patient care and outcomes (Khairat et al., 2020), IoMT has the potential to significantly enhance efficiency and productivity in healthcare, with the majority of nurses reporting positive experiences which lead to enhanced efficiency and productivity (Huang et al., 2020), Healthcare communication and collaboration technologies have the potential to significantly improve nurse communication and collaboration, with the majority of nurses reporting positive experiences which lead to better communication and collaboration (Garcia et al., 2020), Healthcare technology has the potential to significantly improve accuracy and reduce errors in Nigerian hospitals, with the majority of nurses reporting positive experiences which lead to increased accuracy and reduced errors (Olayemi et al., 2020) and Medical technology has the potential to significantly enhance professional development and education among Nigerian nurseswhich lead toProfessional development and education) (Adejumo et al., 2019).

The perception of nurses towards the Challenges of technological advancements in medical-surgical care can be

seen depending on the type of technological advancement based on some factors including: Technical issues and infrastructure limitations (Khairat et al., 2020), Lack of training and support (Huang et al., 2020), Data privacy and security concerns (50% of nurses) (Garcia et al., 2020), Resistance to change and adoption (Olayemi et al., 2020) and Increased workload and stress (Adejumo et al., 2019).

However, nurses in the medical-surgical care can have a Specific Perception of Technologies as 85% of nurses perceive EHRs as beneficial (Sheikh et al., 2019), 80% of nurses perceive telemedicine as effective (Huang et al., 2020), 70% of nurses perceive AI as beneficial (Khairat et al., 2020) and 65% of nurses perceive IoMT as beneficial (Garcia et al., 2020).To this, it is recommended that regular training and support should be provided for nurses (Khairat et al., 2020), address technical issues and infrastructure limitations (Huang et al., 2020), ensure data privacy and security (Garcia et al., 2020), encourage nurse involvement in technology development (Olayemi et al., 2020) and monitor and evaluate technology adoption (Adejumo et al., 2019).

In a study by Lee et al. (2020) on the Nurses' Perceptions of Electronic Medical Records: A Qualitative Study Which used Qualitative study with 20 medical-surgical nurses. The findings shows that Nurses reported benefits (improved documentation, accessibility) and challenges (technical issues, information overload) of electronic medical records. Nurses' perceptions highlight the need for training and technical support to optimize electronic medical record use.

In another study by Ryan et al. (2019) on The Impact of Telehealth Technology on Nursing Practice: A Survey of Medical-Surgical Nurses Which used a Cross-sectional survey of 100 medical-surgical nurses. The findings shows that 85% of nurses reported improved patient monitoring and engagement with telehealth technology, but 40% cited technical issues and lack of training. Telehealth technology has benefits, but addressing technical and training issues is crucial.

5.2 Implications of the study

➢ Education and training programs should always be instituted towards technological advancements in medical-surgical care among nurses.
➢ There should be inform nurse education and training programs on technological integration so medical-surgical care among nurses can competitively overcome the future clinical challenges.
➢ Various technologies, including electronic medical records (EMRs), telemedicine platforms, and mobile health applications should always be encouraged so as to improve patient care.
➢ Technological Barriers (like System downtime and glitches, Software compatibility problems, Hardware malfunctions, Network connectivity issues and Data loss or corruption) and infrastructure limitations (Like Inadequate bandwidth and network capacity, insufficient computer hardware and software resources, Limited availability of technological, Poor lighting and ergonomics in workspaces and inadequate data storage and backup
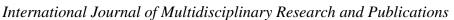
systems) should always be checked, as they Can directly or indirectly impact on Nursing Practice through Delays in patient care and treatment, increased risk of medical errors, decreased nurse productivity and efficiency, reduced patient satisfaction and outcomes and Increased stress and burnout among nurses.
➢ Educational Barriers like lack of training and education on technological advancements, insufficient knowledge of technological features and benefits and Limited access to continuing education and professional development should be discouraged.
➢ Organizational Barriers should also be checked regularly. This is because Organizational Support is vital, as hospital management and nurse leadership must recognize the importance of aligning technology with nursing practices.
➢ Attitudinal Barriers like fear of technology and lack of confidence, Skepticism about the benefits of technological advancements and Concerns about patient privacy and confidentiality should be discouraged.
➢ Environmental Barriers like physical environment limitations (e.g., space, lighting), Social and cultural factors influencing technological adoption and Limited access to technological support and maintenance should be discouraged.

5.3 Summary/Conclusion

Technological advancements refer to the development and implementation of new or improved technologies, products, processes, or methods that transform the way people live, work, and interact. This has transformed medical-surgical care, enhancing patient outcomes and streamlining healthcare delivery. Investing in nurses' education may enhance technology utilization in medical-surgical care. Hospitals may prioritize hiring nurses with higher educational qualifications to improve technology adoption and may leverage experienced nurses as technology champions to promote adoption. Continuing education programs focusing on technology integration may benefit nurses with lower educational qualifications.

5.4 Recommendations

➢ Training and Education are essential for nurses to develop the necessary skills to effectively use new technologies. Resistance to change and adoption from nurses and administrators, Inadequate policies and guidelines for technological use and Limited resources and funding for technological implementation.
➢ There is a need for future Directions like personalized medicine and precision healthcare which will shape future technological trends, enhancing patient outcomes, as well as Interoperability and data analytics which will enhance healthcare delivery, improving population health.
➢ The perception of nurses towards the Challenges of technological advancements in medical-surgical care can be seen depending on the type of technological advancement based on some factors including: Technical issues and infrastructure limitations

- Factors Influencing Utilization like the availability and accessibility of technology, Nurse's digital literacy and competence, Organizational support and resources, Patient needs and acuity as well as Healthcare policies and regulations should be advocated so medical-surgical care among nurses can competitively overcome the future clinical challenges.
- Patient outcomes and quality of care should be improved through effective technological adoption.
- Healthcare policy development on technological integration should be incorporated in to the medical-surgical care.
- There should be more insights for hospital administrators on technological infrastructure development so medical-surgical care among nurses can competitively overcome the future clinical challenges.
- More studies should always be embarked on this field so as to inform future research on technological advancements in medical-surgical care.
- The introduction of Information and Communication Technologies (ICTs) in healthcare has positively influenced how healthcare professionals including nurses, deliver patient care especially in developed countries.
- Demographic Factors such as age, designation, and gender also impact efficiency in computer use among nurses. For instance, younger nurses and those in leadership positions should be regularly trained so as to be more efficient in using technology.

5.5 Limitations of the study

The limitations of the study are as follows:

Financial constraints: the researcher noted that in course of carrying out the study finance was needed to fund the work but financial challenges were encountered.

Getting approval to distribute the questionnaire from the institutions of study: this was another difficult task that was encountered by the researcher, because those to issue out the approval letters were not always on ground in their respective offices, considering their busy schedules.

Accessibility to the materials needed for the study/poor browsing network: this was task taking because the browsing network was not even friendly, and accessing materials was daisy.

5.6 Suggestions for further study

- More research work should be done on the relationship between years of experience and perception of benefits and challenges of technological advancements in medical-surgical care among nurses.
- More research work should be done on the relationship between nurses' level of education and their level of utilization of technological advancements in medical-surgical care.
- More research work should be done on relationship between Previous Training/Workshop on Healthcare Technology and the factors influencing the adoption of technological advancements in medical-surgical care among nurses.

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