

# Examining the Role of Emerging Technologies in Enhancing Nursing Education and Care

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## Abstract

Emerging technologies are transforming nursing education and clinical care by enhancing training methods and improving patient outcomes. This paper explores advancements such as simulation tools, e-learning platforms, and artificial intelligence (AI) in nursing education. Simulation technologies provide realistic, risk-free environments that foster clinical competency and critical thinking. E-learning platforms offer flexible, accessible learning opportunities, especially beneficial during global crises like the COVID-19 pandemic. In clinical care, AI-driven diagnostics, telehealth, and electronic health records (EHRs) optimize treatment accuracy and efficiency, addressing workforce shortages and skill gaps. However, challenges persist, including resistance to change, training deficiencies, and integration issues with existing systems. Financial constraints, especially for smaller institutions, also pose barriers. Future prospects depend on continuous education, fostering innovation, and addressing ethical considerations. This study provides actionable insights for educators, healthcare providers, and policymakers to leverage technology, ensuring enhanced patient care and dynamic learning environments.

**Keywords:** Nursing Education, Emerging Technologies, Simulation Tools, E-learning, Artificial Intelligence, Telehealth

## Introduction

Emerging technologies are revolutionizing various fields, and nursing is no exception. From advanced simulation tools in education to artificial intelligence and predictive analytics in patient care, technological advancements are reshaping how nursing professionals are trained and how they deliver care. This transformation is pivotal as the healthcare sector faces increasing challenges, including an aging population, chronic disease prevalence, and the need for efficient, patient-centered care delivery. At the heart of this evolution is the role of technology in enhancing both nursing education and patient outcomes, the focus of this article.

The integration of technology in nursing is not merely a trend but a necessity to meet contemporary healthcare demands. Advanced tools like virtual reality simulators, electronic health records (EHRs), and mobile health applications are enhancing the precision, safety, and efficiency of nursing practices. Understanding and implementing these tools effectively can significantly improve patient care and address critical issues such as workforce shortages and skill gaps. Thus, a comprehensive examination of these technologies is essential to fully capitalize on their potential.

Despite the rapid advancement and implementation of technology, certain aspects remain underexplored. Current research often emphasizes specific technologies rather than their broader implications on nursing education and care

delivery. Additionally, the literature lacks a cohesive analysis of how these technologies synergize to address systemic challenges in healthcare. This article addresses these gaps by providing an in-depth analysis of emerging technologies and their impact on nursing.

This research distinguishes itself by not only evaluating individual technologies but also assessing their integrated impact on education and care. The study aims to explore how technology can improve competency-based learning for nurses, optimize patient safety, and foster more dynamic learning and working environments. It provides actionable insights for educators, practitioners, and policymakers, ensuring its relevance in academic and practical contexts.

The article is structured into three main sections. The first section delves into the technological innovations shaping nursing education, such as simulation tools and digital learning platforms. The second section examines their application in clinical care, highlighting advancements like AI-driven diagnostics and telehealth systems. Finally, the third section discusses the challenges and future prospects of integrating these technologies, proposing strategies for successful implementation and sustainable growth in the field.

## 1. Research Background

The evolution of nursing education has been significantly influenced by advancements in technology and shifts in educational paradigms. Over the past century, the push for a more educated nursing workforce has been evident, beginning with the calls from historical nursing reports advocating for higher educational standards and expanded responsibilities for nurses, often hampered by societal and economic barriers [1].

In recent years, the integration of technology into nursing education has become a necessity. As highlighted by Ngenzi et al., various technological approaches, categorized into enabling and enhancing technologies, have been identified to support continuing professional development for healthcare providers, particularly in low-income countries like Rwanda[2].

These advancements have led to the utilization of interactive online modules and videos, which are now commonly used educational tools in nursing curricula[2].

A landmark moment in the evolution of nursing education was the 2010 Institute of Medicine report, "The Future of Nursing: Leading Change, Advancing Health," which emphasized the need for a highly educated nursing workforce, setting ambitious goals for baccalaureate and doctoral nursing degrees[1].

This shift toward competency-based education further redefined nursing curricula, focusing on developing critical knowledge, skills, and attitudes necessary for effective nursing practice rather than merely time spent in academic or clinical settings[3].

As technology continues to shape the educational landscape, nursing education has transitioned from traditional methods reliant on textbooks and lectures to incorporating diverse educational technologies. This includes simulation labs, telehealth platforms, and immersive virtual reality experiences, which have revolutionized how nursing students learn and practice[4, 5].

Such tools not only enhance the learning experience but also better prepare students for the complexities of modern healthcare delivery, thereby addressing the growing demand for qualified nurses amidst an evolving healthcare environment[6, 7].

This ongoing transformation underscores the necessity for nursing education to adapt continually, integrating innovative technologies to ensure that future nurses are equipped to meet the demands of a rapidly changing healthcare system.

## 2. Technological Innovations in Nursing Education

Technological innovations in nursing education encompass a range of advancements that enhance learning experiences, improve patient care, and optimize nursing practice. These innovations can be broadly categorized into several types, including e-learning platforms, simulation technologies, and the integration of artificial intelligence.

### 2.1 E-Learning Innovations

E-learning has emerged as a primary method for continuing education in nursing, particularly in response to recent global events such as the COVID-19 pandemic, which accelerated its adoption. E-learning can be synchronous, allowing real-time interaction between learners and instructors, or asynchronous, which provides flexibility for learners to study at their own pace [8].

Asynchronous e-learning methods, including interactive online modules and video content, enable nurses to balance professional development with personal commitments [9].

The effectiveness of these programs is enhanced through the incorporation of interactive elements that foster learner engagement and motivation [9].

### 2.2 Simulation Technologies

Simulation technologies are critical in nursing education, offering practical, hands-on experience in a safe environment. High-fidelity simulation, which uses advanced mannequins and computer-based scenarios, allows nursing students to apply clinical reasoning and critical thinking skills to evolving case studies.[10, 11].

These technologies provide a realistic context for learning, significantly enhancing knowledge retention and understanding of nursing concepts[11].

The use of partial-task simulators also allows students to repeatedly practice specific skills, reinforcing their clinical competence[12].

### 2.3 Integration of Artificial Intelligence

Artificial intelligence (AI) is poised to revolutionize nursing education and practice by providing tools that can predict patient outcomes, identify high-risk patients, and assist in diagnosis and treatment planning[12].

The potential for AI to save substantial costs in the healthcare system underscores its value in optimizing nursing efficiency and effectiveness[13].

As AI technologies continue to evolve, they are expected to play an increasingly significant role in shaping the future landscape of nursing education and patient care.

## 3. clinical care

Clinical care refers to the comprehensive array of services provided by healthcare professionals aimed at diagnosing, treating, and managing health conditions in patients. It encompasses various levels of care, including primary, specialized, inpatient, and emergency care, delivered by a diverse team of providers such as physicians, nurses, and allied health professionals. The evolution of clinical care has been significantly influenced by advancements in medical knowledge, changes in healthcare delivery systems, and the growing emphasis on patient-centered approaches, which prioritize individual patient needs and shared decision-making.

### 3.1 Clinical and Non-Clinical Roles

Clinical care encompasses a range of roles that provide direct patient care, including physicians, nurses, and allied health professionals such as physical therapists, occupational therapists, and pharmacists[14].

Allied health professionals play a vital role in enhancing patient outcomes through specialized interventions. On the other hand, non-clinical roles, while not involved in direct patient diagnosis or treatment, support the healthcare system's operational aspects. These roles include medical billers, transcriptionists, and IT specialists, who facilitate the administrative and technological functions necessary for effective patient care delivery[14].

### 3.2 Clinical Practice Guidelines

Clinical practice guidelines are essential for optimizing patient care. These guidelines provide recommendations informed by systematic reviews of evidence and evaluations of treatment options' benefits and harms[15].

Rather than enforcing a rigid approach, they encourage healthcare providers to consider individual patient preferences and specific clinical contexts. This personalized approach aids clinicians in selecting the most appropriate care for each patient, promoting better health outcomes[16].

### 3.3 Coordination and Communication

Effective clinical care relies on strong coordination and communication among healthcare providers. The integration of specialists with primary care physicians is critical for delivering comprehensive care[16].

Value-based care models reward coordinated efforts, ensuring that patients receive holistic care. To enhance teamwork, the implementation of roles such as care coordinators and nurse navigators can help bridge communication gaps between various healthcare services, ultimately leading to improved patient navigation through complex healthcare systems[17].

### 3.4 Patient-Centered Outcomes

The quality of clinical care is often assessed through patient experiences and outcomes. Effective communication, both verbal and non-verbal, significantly influences these outcomes[17].

Monitoring patient experiences allows healthcare professionals to identify areas for improvement, ensuring that care delivery aligns with patient needs and preferences. Various assessment tools, such as the Consumer Assessment of Healthcare Providers and Systems (CAHPS), are utilized to gather this data, which is crucial for continuous quality enhancement in clinical settings[18].

### 3.5 Diagnostic Process and Safety

A critical component of clinical care is the diagnostic process, which involves a multidisciplinary approach to accurately identifying patient conditions. This process requires collaboration among clinicians, laboratory personnel, and diagnostic specialists, ensuring timely and accurate diagnoses that are vital for effective treatment plans[19].

Organizations are increasingly focusing on minimizing diagnostic errors through improved communication and coordination, implementing protocols that ensure all test results are reliably transmitted to responsible clinicians[19].

### 3.6 Types of Clinical Care

Clinical care encompasses a broad range of services delivered by healthcare professionals aimed at diagnosing, treating, and managing patients' health conditions. This care can be categorized into several types based on the setting, purpose, and professionals involved.

#### 3.6.1 Primary Care

Primary care serves as the first point of contact within the healthcare system, providing accessible, continuous, and comprehensive care. Primary care providers include family medicine physicians, internists, pediatricians, nurse practitioners, and physician assistants. They are responsible for managing acute and chronic health conditions, performing health screenings, and offering preventive services such as vaccinations and lifestyle counseling[19, 20].

The primary care model emphasizes person-centered care, which ensures that individuals are involved in their treatment decisions and have access to coordinated care across various health services[20].

#### 3.6.2 Preventive Care

Preventive care is a vital component of primary care that focuses on identifying health issues before they become serious. It includes regular screenings for diseases like heart disease and diabetes, counseling for lifestyle changes, and vaccinations for both adults and children. Health insurance plans typically cover preventive services to promote early detection and improve health outcomes[21].

### 3.7 Specialized Care

Specialized care is delivered by healthcare professionals who focus on specific areas of medicine. This includes specialists such as cardiologists, endocrinologists, and orthopedists who provide advanced treatment options for particular conditions. Patients often receive referrals from primary care providers to specialists for further evaluation and management of complex health issues[22].

#### 3.7.1 Inpatient Care

Inpatient care involves the treatment of patients who require hospitalization. Hospitalists, who are physicians specializing in the care of hospitalized patients, play a crucial role in coordinating care during a patient's stay. This type of care is essential for managing severe conditions that cannot be treated in an outpatient setting, providing continuous monitoring and immediate access to advanced medical interventions[23].

#### 3.7.2 Emergency Care

Emergency care is designed for acute health situations that require immediate attention, such as trauma, severe pain, or life-threatening conditions. Emergency departments are staffed by emergency medicine physicians and other healthcare professionals trained to handle critical cases efficiently and effectively[24].

#### 3.7.3 Allied Health Services

Allied health professionals support clinical care through various roles that enhance patient treatment and recovery. This includes physical therapists, occupational therapists, and radiologic technologists, who work collaboratively with physicians and nursing staff to provide comprehensive care plans tailored to individual patient needs[25].

## 4. Challenges and Future Prospects of Integrating Technologies in Nursing and Clinical Care

The integration of technologies in nursing and clinical care represents a significant evolution in healthcare delivery, aimed at enhancing patient outcomes and operational efficiency. Technologies such as Electronic Health Records (EHRs), telehealth, and wearable devices have transformed traditional nursing practices, facilitating real-time access to patient data, streamlining workflows, and enabling more informed decision-making:

### 4.1 Challenges in Integrating Technologies

The integration of technology into nursing and clinical care presents several challenges that must be addressed to ensure successful implementation and utilization. These challenges include resistance to change, training deficiencies, integration issues with existing systems, cost implications, and potential job displacement.

### 4.2 Resistance to Change

Resistance to change is a prevalent obstacle when introducing new technologies in healthcare settings. Many nurses, particularly those who have long been accustomed to traditional practices, may be reluctant to embrace technological advancements due to a lack of knowledge or fear of the unknown.[26, 27].

Effective change management strategies are essential to overcome this resistance. Engaging nurses in the decision-making process, clearly communicating the benefits of new technologies, and providing robust support during the transition can foster a positive environment conducive to adaptation[28].

#### 4.3 Training Deficiencies

Another significant challenge is the inadequacy of training and education related to new technologies. Some nurses may feel intimidated or lack confidence in using advanced tools, which can hinder their ability to provide optimal patient care[29].

Comprehensive training programs that include hands-on practice and ongoing support from IT personnel are crucial in enhancing nurses' comfort and proficiency with technological tools. Continuous opportunities for inquiry and clarification can further mitigate the intimidation some nurses feel[29].

#### 4.4 Integration with Existing Systems

Integrating new technologies with existing systems, such as electronic health records (EHRs), poses considerable challenges. Early involvement of IT personnel and nurse managers during planning and implementation can help identify and resolve integration issues before they escalate.[30, 31].

The complexities of ensuring interoperability between various technological tools and established systems require careful consideration and collaboration among stakeholders to achieve seamless integration.[31].

#### 4.5 Cost Implications

The financial implications of implementing and maintaining advanced technologies can also pose challenges, particularly for smaller healthcare organizations with limited budgets[32].

Healthcare providers must carefully evaluate the costs associated with technology integration against the expected benefits to ensure value for money. A lack of adequate resources can inhibit the successful adoption of new technologies, making it crucial for organizations to secure funding and support for such initiatives.[33].

#### 4.6 Potential Job Displacement

As technology continues to evolve, concerns regarding job displacement among nursing professionals arise. It is vital to strike a balance between integrating technology and maintaining the essential human touch and empathy that are core to nursing practice[33].

Ensuring that technology augments rather than replaces the roles of healthcare providers is essential for preserving the quality of care while leveraging advancements in technology.[34]

#### 4.7 Future Prospects of Technology Integration

The future of technology integration in nursing and clinical care is poised for transformative growth, driven by a commitment to enhancing patient outcomes and improving operational efficiency. As healthcare systems increasingly recognize the value of technological innovations, several key trends and strategies are emerging to facilitate this integration.

##### 4.7.1 Emphasis on Continuous Education and Training

A cornerstone of successful technology adoption is the emphasis on ongoing education and training for nursing professionals. Comprehensive training programs are essential to equip nurses with the skills needed to effectively utilize new technologies[34].

This approach not only addresses resistance to change but also ensures that healthcare providers can maximize the benefits of technological tools, leading to improved patient care outcomes[33, 34].

Collaboration between nurses, healthcare providers, and technology vendors will further enhance training efforts and identify solutions to integration challenges[34].

##### 4.7.2 Fostering a Culture of Innovation

Healthcare executives play a crucial role in fostering a culture that embraces innovation. Establishing tech committees and encouraging a mindset that values both success and learning from failure will be pivotal in driving the adoption of new technologies[35].

Organizations that prioritize a culture of continuous improvement will be better equipped to adapt to the rapid advancements in technology and their implications for clinical practice[35].

##### 4.7.3 Addressing Integration Challenges

While the benefits of technology in nursing are clear, integration challenges remain a significant barrier. The complexity of merging new systems with existing electronic health records can create obstacles[36].

To mitigate these challenges, it is vital to involve IT personnel and nurse managers in the planning and implementation processes from the outset. Early collaboration can help identify potential integration issues, paving the way for smoother transitions[36].

#### 4.8 Future Innovations and Technological Advancements



Looking ahead, the healthcare sector is expected to witness significant advancements in medical technology, such as telehealth, artificial intelligence, and advanced sensors[37].

These innovations will not only enhance clinical practices but also reshape the management and organization of care processes. Organizations that stay ahead of technological trends and are willing to adapt their operations will likely experience substantial growth and improved patient outcomes in the coming years[37].

#### 4.8.1 Navigating Ethical and Legal Considerations

As the integration of technology in nursing continues to expand, addressing ethical and legal issues related to data management and privacy will be crucial[38].

The development of macro-policies that govern these aspects will be necessary to ensure that healthcare organizations can navigate the complexities of technological integration while maintaining compliance and protecting patient rights [39].

## 5. Discussion and Results

In this study, we examined the transformative role of emerging technologies in nursing education and clinical care. The findings underscore that technological advancements such as simulation tools, e-learning platforms, and artificial intelligence (AI) are reshaping how nursing professionals are trained and deliver care.

### 5.1 Impact on Nursing Education:

Simulation technologies emerged as pivotal tools, offering immersive, risk-free environments for students to practice clinical scenarios. High-fidelity simulations enhance critical thinking and clinical decision-making, significantly improving learning outcomes. Additionally, e-learning platforms provide flexibility and accessibility, allowing nursing professionals to engage in continuous learning without disrupting their clinical responsibilities. However, challenges such as resistance to technology adoption and deficiencies in training programs remain obstacles that institutions must address to maximize these benefits.

### 5.2 Clinical Care Advancements:

AI and telehealth are revolutionizing patient care delivery. AI-driven tools support diagnostics and treatment planning, enhancing accuracy and efficiency. Telehealth services expand access to care, particularly in underserved regions, and improve patient monitoring and follow-up. However, the integration of these technologies faces challenges, including interoperability issues with existing systems and concerns about data security and patient privacy.

### 5.3 Key Challenges and Future Prospects:

The integration process is often hampered by resistance from staff accustomed to traditional practices. Comprehensive training and change management strategies are crucial for fostering acceptance. Financial constraints also pose a significant barrier, especially for smaller healthcare institutions. Looking forward, fostering a culture of innovation and investing in continuous education will be vital. Collaboration between healthcare providers, educators, and technology developers can drive sustainable growth and ensure technologies enhance—rather than replace—the human aspects of nursing.

In conclusion, emerging technologies present immense opportunities to improve nursing education and clinical care. However, addressing integration challenges and ensuring ongoing training are essential for realizing their full potential. These insights can guide policymakers, educators, and healthcare administrators in leveraging technology to enhance patient outcomes and workforce efficiency.

## 6. Conclusions

In summary, this study highlights the transformative impact of emerging technologies on nursing education and clinical care. The integration of advanced tools such as simulation technologies, e-learning platforms, and artificial intelligence has significantly enhanced the quality and efficiency of nursing practices. These innovations provide nursing professionals with immersive, risk-free training environments and flexible learning opportunities, which are crucial in preparing them to address the complexities of modern healthcare.

However, challenges persist, including resistance to technological adoption, inadequate training programs, and financial constraints, particularly for smaller healthcare institutions. Addressing these issues requires comprehensive training initiatives, change management strategies, and collaboration among healthcare providers, educators, and technology developers. Creating a culture that embraces innovation and continuous learning is essential for overcoming these barriers and fully realizing the potential of these advancements.

Looking forward, the successful integration of technology in nursing will depend on sustained efforts to address ethical considerations, ensure interoperability, and protect patient data. By fostering a holistic approach that



balances technological efficiency with the human touch inherent in nursing, healthcare systems can improve patient outcomes and enhance workforce efficiency. These findings provide valuable insights for policymakers, educators, and healthcare administrators in leveraging technology to build a resilient and future-ready nursing sector.

## Refernces

- [1] Baker, C., Cary, A. H., & da Conceicao Bento, M. (2021). Global standards for professional nursing education: The time is now. *Journal of Professional Nursing*, 37(1), 86-92.
- [2] Burton, C. W., Williams, J. R., & Anderson, J. (2019). Trauma-informed care education in baccalaureate nursing curricula in the United States: Applying the American Association of Colleges of Nursing Essentials. *Journal of forensic nursing*, 15(4), 214-221.
- [3] Fura, L. A., & Wisser, K. Z. (2017). Development and evaluation of a systems thinking education strategy for baccalaureate nursing curriculum: a pilot study. *Nursing Education Perspectives*, 38(5), 270-271.

- [4] Yakusheva, O., & Weiss, M. (2017). Rankings matter: nurse graduates from higher-ranked institutions have higher productivity. *BMC health services research*, 17, 1-8.
- [5] Koster, Y., & van Houwelingen, C. (2017). Technology-based healthcare for nursing education within the Netherlands: past, present and future. In *Forecasting Informatics Competencies for Nurses in the Future of Connected Health* (pp. 101-110). IOS Press.
- [6] Farra, S. L., Smith, S. J., & Ulrich, D. L. (2018). The student experience with varying immersion levels of virtual reality simulation. *Nursing education perspectives*, 39(2), 99-101.
- [7] Krumwiede, K. A., Eardley, D. L., DeBlieck, C. J., & Martin, K. S. (2023). Creating a quadruple aim model for nursing education. *Public Health Nursing*, 40(3), 448-455.
- [8] You, L. M., Ke, Y. Y., Zheng, J., & Wan, L. H. (2015). The development and issues of nursing education in China: A national data analysis. *Nurse Education Today*, 35(2), 310-314.
- [9] Randolph, A., & Matthey, B. (2023). Moving Upstream to Address Health Inequity: A Middle School Program to Introduce Students to a Career in Nursing. *NASN School Nurse*, 38(1), 33-39.
- [10] Richey, R., Woodfin, K., Nguyen, S., Kopf, S., Haamankuli, H., McMullan, S., & Yerdon, A. (2024). Collaborative nursing education between advanced practice registered nurses. *Journal of Professional Nursing*.
- [11] Rood, L., Tanzillo, T., & Madsen, N. (2022). Student nurses' educational experiences during COVID-19: A qualitative study. *Nurse Education Today*, 119, 105562.
- [12] Harerimana, A., Wicking, K., Biedermann, N., & Yates, K. (2021). Integrating nursing informatics into undergraduate nursing education in Africa: A scoping review. *International Nursing Review*, 68(3), 420-433.
- [13] Goh, H. S., Tang, M. L., Lee, C. N., & Liaw, S. Y. (2019). The development of Singapore nursing education system—challenges, opportunities and implications. *International Nursing Review*, 66(4), 467-473.
- [14] Furr, S., Lane, S. H., Martin, D., & Brackney, D. E. (2020). Understanding roles in health care through interprofessional educational experiences. *British Journal of Nursing*, 29(6), 364-372.
- [15] Wilson, R., Godfrey, C. M., Sears, K., Medves, J., Ross-White, A., & Lambert, N. (2015). Exploring conceptual and theoretical frameworks for nurse practitioner education: a scoping review protocol. *JBIC Evidence Synthesis*, 13(10), 146-155.
- [16] Schofield, R., Chircop, A., Filice, S., Filion, F., Lalonde, S., Riselli, D. M., ... & Vukic, A. (2022). Public health in undergraduate nursing education and workforce readiness. *Public health nursing*, 39(6), 1361-1373.
- [17] Graziano, J. A., Uppman, F., Anderson, K., Johnson, L., Frosch-Erickson, S., Hill, D., ... & Kohler, S. (2017). Minnesota Alliance for Nursing Education (MANE): A unique multi-institutional approach to preparing nurses for the future. *Nursing education perspectives*, 38(5), E2-E7.
- [18] Lang, M., Ghandour, S., Rikard, B., Balasalle, E. K., Rouhezamin, M. R., Zhang, H., & Uppot, R. N. (2024). Medical extended reality for radiology education and training. *Journal of the American College of Radiology*.
- [19] LeVasseur, S. A., & Qureshi, K. (2015). Hawai 'i's Nursing Workforce: Keeping Pace with Healthcare. *Hawai'i Journal of Medicine & Public Health*, 74(2), 45.
- [20] Haas, B. K., Mark, D. D., LeVasseur, S. A., Ziehm, S. R., Hrabe, D. P., Clayton, M. F., ... & McNeil, P. (2016). NEXus: Making efficient use of limited resources. *Journal of Professional Nursing*, 32(6), 449-457.
- [21] Su, J. J., Masika, G. M., Paguio, J. T., & Redding, S. R. (2020). Defining compassionate nursing care. *Nursing ethics*, 27(2), 480-493.
- [22] Saab, M. M., Landers, M., Egan, S., Murphy, D., & Hegarty, J. (2021). Nurses and nursing students' attitudes and beliefs regarding the use of technology in patient care: a mixed-method systematic review. *CIN: Computers, Informatics, Nursing*, 39(11), 704-713.
- [23] Fu, X., You, L., Liu, X., Zheng, J., Gubrud-Howe, P., Liu, J., ... & Wan, L. (2022). Developing trends of initial nursing education in China from 2006 to 2017: A descriptive analysis based on national-level data. *Nurse Education Today*, 110, 105271.
- [24] Dyck, N., Martin, D., & McClement, S. (2021). Baccalaureate Education as an Entry-to-Practice Requirement: Why It Matters Now More Than Ever. *Nursing Leadership* (1910-622X), 34(4).
- [25] Buerhaus, P. I., Auerbach, D. I., & Staiger, D. O. (2016). Recent changes in the number of nurses graduating from undergraduate and graduate programs. *Nursing economics*, 34(1), 46.
- [26] Brixey, J. J. (2016). Health informatics competencies, workforce and the DNP: why connect these 'dots'?. In *Nursing Informatics 2016* (pp. 750-752). IOS Press.
- [27] Van Iersel, M., Latour, C. H., van Rijn, M., De Vos, R., Kirschner, P. A., & op Reimer, W. J. S. (2018). Factors underlying perceptions of community care and other healthcare areas in first-year baccalaureate nursing students: A focus group study. *Nurse Education Today*, 66, 57-62.



- [28] Bouchaud, M. T., & Swan, B. A. (2017, January). Integrating correctional and community health care: an innovative approach for clinical learning in a baccalaureate nursing program. In *Nursing Forum* (Vol. 52, No. 1, pp. 38-49).
- [29] Mukamana, D., Dushimiyimana, V., Kayitesi, J., Mudasumbwa, G., Nibagwire, J., Ngendahayo, F., ... & Rosa, W. (2016). Nephrology nursing in Rwanda: Creating the future through education and organizational partnership. *Nephrology Nursing Journal*, 43(4), 311.
- [30] Wynn, M., Garwood-Cross, L., Vasilica, C., Griffiths, M., Heaslip, V., & Phillips, N. (2023). Digitizing nursing: A theoretical and holistic exploration to understand the adoption and use of digital technologies by nurses. *Journal of Advanced Nursing*, 79(10), 3737-3747.
- [31] Rugs, D., Barrett, B., Chavez, M., Cowan, L., Melillo, C., Sullivan, S. C., ... & Powell-Cope, G. (2020). Doctoral-prepared nurses in the Veterans Health Administration: A cross-sectional survey. *Journal of Professional Nursing*, 36(1), 62-68.
- [32] Cha, C., Hwang, H., An, B., Jeong, S., & Yang, S. J. (2020). Nursing student and faculty competency improvement through a nurse-bridging program in Cambodia. *Nurse education today*, 93, 104523.
- [33] Nelson, A. M. (2020). The evolution of professional obstetric nursing in the United States (1880' s-present): Qualitative content analysis of specialty nursing textbooks. *International Journal of Nursing Studies Advances*, 2, 100010.
- [34] Wynn, S. (2016). Preparing today's nursing students for tomorrow's career. *Issues in Mental Health Nursing*, 37(4), 245-248.
- [35] Harper, K. J. (2021). The Future of Nursing Report Set the Stage for Healthier Hoosiers. *Nursing Administration Quarterly*, 45(1), 46-51.
- [36] Martin, D. R., & Furr, S. B. (2023). Through the lens of the American Association of Colleges of Nursing's (AACN) new Essentials: Integration of human trafficking education and simulation within baccalaureate nursing curricula. *Journal of Professional Nursing*, 47, 31-34.
- [37] Close, L., & Orlowski, C. (2015). Advancing associate degree in nursing-to-baccalaureate degree in nursing academic progression: the California collaborative model for nursing education. *Journal of Nursing Education*, 54(12), 683-688.
- [38] Shen, Q., Peltzer, J., Teel, C., & Pierce, J. (2015). The initiative to move toward a more highly educated nursing workforce: Findings from the Kansas registered nurse workforce survey. *Journal of Professional Nursing*, 31(6), 452-463.
- [39] Reid, L., Button, D., Breaden, K., & Brommeyer, M. (2022). Nursing informatics and undergraduate nursing curricula: A scoping review protocol. *Nurse Education in Practice*, 65, 103476.