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The Evolving Role of Nursing Technicians and Specialists in Integrating Health Informatics: A Review

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ABSTRACT

The rapid progression of health informatics has revolutionized the landscape of health care delivery thereby requiring nurses to be full stakeholders in all levels of care settings. BackgroundThis review describes the changing roles of nursing technicians and nursing specialists in incorporating health informatics into clinical practice. For example, nursing technicians are now more involved in using electronic health records (EHRs), telehealth services, and collecting data to improve monitoring from care providers. Within the nursing specialism, informatics is used at a much more advanced level, for example in developing evidence based decision-making tools; and building digital care pathways and contributing to multidisciplinary health information management projects. This review postulates the way in which roles collaborate to increase patient safety, improve workflow efficiency and promote patient centered care from 2010 until 2025. Key factors identified included a need for more formalised informatics training, well defined role boundaries and policy that provides clear pathways for nursing roles to be enacted in the digital health space. Interprofessional collaboration should be expanded, artificial intelligence tools should be integrated, and nursing informatics competencies across all levels available at the point of care to address burgeoning modern health-care needs.

Keywords: Nursing technicians, Nursing specialists, Health informatics, Digital healthcare, Electronic health records, Interdisciplinary collaboration

INTRODUCTION

With the transformation of healthcare into the digital domain, health informatics has rapidly become a cornerstone of modern clinical practice. Examples of informatics tools that are changing the documentation, coordination and delivery of care include electronic health records (EHRs), telehealth platforms and clinical decision support systems (Hebda et al., 2019). These technologies are streamlining workflows and leading to more patient-centered, evidence-based practice. In this scenario, the roles associated with nursing professionals, mainly nursing technicians and nursing specialists, have been considerably expanded, mediating from the technological innovations to the bedside practice (Darvish et al., 2014).

Nursing technicians are one of the first users of digital systems supporting data entry, keeping timely records and helping in telehealth and remote monitoring programs. They play a critical role in ensuring the information about the patient is timely, precise, and available for continuous care (Park & Lee, 2020). In contrast, one of the roles that nursing specialists assume is an advanced level role in informatics which supports clinical decision making, quality improvement projects, and interprofessional collaboration (Collins et al., 2022) They frequently act as a bridge between IT staff and clinical personnel, both in optimizing the functionalities of the systems and in facilitating the utilization of evidence-based digital health solutions.

Despite these advancements, challenges remain. Variability in informatics competency, restricted access to formal training, and confusion about their duties among various nursing cadres have been documented (Topaz &Pruinelli, 2017). Other impacts of rapidly evolving digital technologies like cloud computing include workload, data security (revised data security policy for e-health/the Electronic Health Record), and usability (policies-related to usability) prevent the use of new technologies in order to support ongoing professional development (Saba & McCormick, 2021).

This review discusses the integration of health informatics in clinical practice for nursing technicians and specialists, as reflected on the existing literature. The paper explores the contributions, strengths, challenges, opportunities, and preferred training models for the various professions involved, intending to inform workforce training, interdisciplinary

collaboration, and next generation policy development to help create a more effective and patient-centred digital healthcare ecosystem.

METHODOLOGY

This review used a narrative synthesis and search and appraisal methods to explore the changing roles of nursing technicians and nursing specialists in terms of the incorporation of health informatics in clinical practice.

Search Strategy

Methods — A multi-database search of PubMed, CINAHL, Scopus, Web of Science, and Google Scholar was conducted for studies from January 2010 to June 2025. Several combinations of the following keywords and MeSH terms were searched: nursing technicians, nursing specialists, health informatics, electronic health records, digital health, telehealth and clinical decision support. Boolean operators (AND/OR) were used to narrow down the search results. Screening of reference lists of relevant articles as a means of discovering additional sources.

Inclusion and Exclusion Criteria

Inclusion criteria:

Reasearch Studies and reviews that assess the impact of roles of nursing technicians and/or nursing specialists as one or more interventional steps in health informatics.

Studies related to informatics tools (eg, EHRs, telehealth systems, or clinical decision support systems).
Studies performed in hospital, community, or long-term care settings.
Peer-reviewed English language journal publications from 2010 to 2025.

Exclusion criteria:

Commentaries, editorials, and conference abstracts without primary data
Non-nursing roles in informatics or purely technical IT studies.

Data Extraction and Synthesis

A standardized data charting form was used to extract data: author(s), year, study design, population, setting, informatics tool used, nursing role(s) and key findings. Data extracted were synthesised in theme categories:
Nursing technician positions in informatics integration
Advancing digital care — roles of nursing specialists
Barriers and facilitators to informatics adoption
Patient Care Outcomes: The Integration of Informatics

Quality Appraisal

For qualitative studies, we applied the Critical Appraisal Skills Programme (CASP) checklist, and the Joanna Briggs Institute (JBI) appraisal tools were used for cross-sectional and mixed-method studies. PRISMA guidelines (Moher et al., 2009) were used for assessing systematic reviews. Synthesis excluded studies of low or very low quality.

Ethical Considerations

Since this study did not involve human participants or new data, ethical approval was not required.

RESULTS

Results62 studies were included of which 28 were cross sectional, 14 were qualitative, 10 were mixed method and 10 were systematic reviews and published between 2010 and 2025. Both hospital (55%), community-based (27%), and long-term care or rehabilitation facilities (18%) settings were represented in the studies. ResultsThematic synthesis detailed four key domains reflective of the evolving role of nursing technicians and nursing specialists in the implementation of health informatics.

Nursing Technicians: Responsible Workforce front of the Informatics systems

Nursing technicians were termed highly important for the realization of electronic health records (EHRs), data input, and real-time patient monitoring [4]. Technicians were reported to have helped update patient information, document vital signs, and assist with telehealth visits, particularly in underserved or rural settings (Park & Lee, 2020). When other staff added nursing technicians to EHR workflows, data grew more accurate, documentation more timely, and communication

between frontline caregivers and interdisciplinary teams became easier. On the other hand, other studies pointed out inconsistency of the informatics competency and emphasized the need of systematic informatics training (Darvish et al., 2014).

Nursing Specialists: Leading the Way in Integrating Digital Care
More technically, nursing specialists used informatics to inform practice and make decisions based on best available evidence, lead quality improvement initiatives, and communicate with members of interdisciplinary teams. In some studies, training was performed by specialists, EHR templates were optimized, or usability was improved through collaboration with IT (Collins et al., 2022). Additionally, informatics-enabled population health management strategies included targeting interventions to high-risk patients, groups, or communities. The literature revealed nursing specialists to optimize clinical workflows and connect technology to the bedside which resulted in improving staff satisfaction and improve patient outcomes.

Integrated Disciplines & Auspices in Informatics
Institutional supports such as training in informatics, accessible EHR interfaces, and continued collaborative work across disciplines were featured facilitators (Saba & McCormick, 2021). In contrast, facilitators encompassed lack of role clarity, time scarcity, and perceived technical complexity that were deterrents to maximizing the use of informatics systems (Topaz &Pruinelli, 2017).

Impact on Patient Care Outcomes
Nursing informatics implementation translated to quality care, which necessitated plugged in roles of nursing informatics to optimize the result of care coordination, documentation errors, and patient engagement improvement (Hebda, et al., 2019). However, nursing was associated with higher patient satisfaction scores and better chronic disease management outcomes (diabetes, hypertension) in telehealth-supported models (McBride et al., 2020).

DISCUSSION

The objective of this review was to illustrate the transformations of the roles of nursing care workers and nursing specialists, in the redesign of a hyperconnected health system. With the use of tools including electronic health records (EHRs), telehealth platforms, and clinical decision support systems, these professionals are not only reshaping the way care is delivered and the way patients are kept safe, they are also building interprofessional collaboration.

An expansion of Nursing Technicians roles in a digital health context
Frontline informatics tasks traditionally performed by nursing technicians, such as electronic health record data entry, patient discharge information updating, and telehealth workflows now increasingly live within the scope of practice of the nursing technician. By taking part, they guarantee that data are accurate, up to date and ground decision-making (Park & Lee, 2020). Neither of these points is surprising, but the results show some variability in informatics competance that could effect data quality. This is consistent with earlier studies that have suggested that structured training in informatics is critical for maximizing the contributions of nurses with informatics knowledge (Darvish et al., 2014).

Leaders are well positioned to move informatics integrate into the practice of nursing specialists.
The authors describe nursing informatics as one of three core nursing arenas in which nursing integrates, and further positions nursing specialists as leading agents of digital transformation within these arenas. Roles include developing EHR templates, guiding training for multidisciplinary teams, and liaising between IT specialists and clinical staff (Collins, et al., 2022). These results support prior studies indicating the value of nurse specialists using digital population health management and chronic disease approaches to improve workflow and care.

Impeding and Facilitating Factors to Implementation of Informatics
Although some progress has been made, barriers including role ambiguity, technological complexity, and insufficient protected time to engage in informatics activities remain (Topaz &Pruinelli, 2017). The enablers are existence of continuous institutional support, decent clinical EHR interfaces and coordination in training programs (Saba & McCormick, 2021). By incorporating policy interventions that offer training courses and other forms of professional development whilst also clarifying these roles, adoption rates may improve and the integration of informatics be more effective.

Impact on Patient Outcomes
Engagement of nurses in informatics has been linked to greater care coordination, higher patient engagement, and reduced documentation errors (Hebda et al., 2019). Especially the models supported by telemedicine were significantly successful in

improving accessibility and chronic disease management outcomes, indicating the potential of digital tools in omitting gaps of care (McBride et al., 2020).

Implications for Practice and Policy

Results reinforce that informatics education should be taught at all levels within nursing, informatics competencies should be incorporated in licensure standards and more funds are needed to support front line nurses to carry out informatics-enabled innovation projects. Policymakers and healthcare administrators As information and communication technologies become more entrenched in our clinical practices, the integration of nursing perspectives in early health IT system design, implemention and workflow processes will be critical to ensure that these tools support rather than complicate patient care.

Limitations and Future Research

The limitations of this review are the high heterogeneity of the studies included and the low number of studies with role differentiation between nursing technicians and nursing specialists. Additional studies are needed to examine the cost-effectiveness of these nurse-led informatics interventions, to determine the lasting effects on patient outcomes, and to explore how to best incorporate emerging technologies like AI and predictive analytics into nursing workflows.

CONCLUSION

If the integration of health informatics is making changes to the job description of nursing technicians and nursing specialists as less about physical services and more about electronic health care delivery, it is proof that the identity of the nursing skills in clinical panels is changing from passive participation into the active participation of digital health care delivery. Through accurate documentation, support for telehealth and real-time patient data, nursing technicians bolster care, while nursing specialists engage as leaders of digital transformation, facilitating evidence-based, interdisciplinary practice, and optimizing entry point workflows. All three of these titles come together to add to patient safety, care coordination, and efficiency in care settings.

To optimize this potential, there are two critical steps: healthcare organizations should provide additional training in the form of structured informatics training, and define expectations around these specialized roles and informatics policies that drive nurse-led digital contributions. We argue that these roles need to be further reinforced within interdisciplinary frameworks to facilitate effective health informatics tool utilization while ensuring that digital healthcare upholds values of patients at its center and efficiently and equitably. More research is needed on long-term impact, cost-benefit, and the incorporation of developing techniques, such as aspects of artificial intelligence into health informatics that will better delineate the ever-expanding perimeters of nursing health informatics.

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